

PINNACLE

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STUDIO™

(PLUS)

version 9



USER MANUAL

D\GB\F\NL\E\DK\FIN\B\NHUS\PL\CZCS\ROK

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P PINNACLE
SYSTEMS
www.pinnaclesys.com

Pinnacle Studio 9

*Including Studio SE, Studio QuickStart,
Studio Standard and Studio Plus*

***Easy, MORE Powerful,
MORE Creative Video Editing***

Special thanks to Mike Iampietro, William Chien, Richard Edgley, Ivan Maltz, Jon McGowan, Keith Thomson, Jörg Weselmann, and Chris Zamara.

Documentation: Nick Sullivan

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Before you start

Thank you for purchasing Pinnacle Studio. We hope you enjoy using the software.

This manual covers all versions of Studio, including Studio Plus. Differences between versions will be noted as applicable. Most of the time, the word "Studio" will be used generically to refer to all versions.

If you have not used Studio before, we recommend that you keep the manual handy for reference even if you don't actually read it all the way through.

In order to ensure that your Studio experience gets off on the right foot, please review the three topics below before continuing to *Chapter 1: Using Studio*.

Equipment requirements

In addition to your Studio software, here is what you need to make a Studio editing system.

Computer

- Intel Pentium or AMD Athlon 800 MHz or higher (1.5 GHz or higher recommended)
- Microsoft Windows 98 SE, Windows "Millennium", Windows 2000 or Windows XP (recommended). The MicroMV digital video format is supported only under Windows XP.

- Graphics card compatible with DirectX 9 (ATI Radeon or NVIDIA GeForce2 or higher recommended)
- Sound card compatible with DirectX 9
- Audio system with Dolby Pro Logic compatibility if previewing surround-sound mixes is required
- 256 MB of RAM (512 MB recommended)
- CD-ROM drive
- DVD drive for installing the bonus DVD containing tutorial, electronic manual and bonus content. The same content is available free on CD-ROMs from the Pinnacle e-store (shipping cost *not* included).
- Speakers
- Mouse
- A microphone, if you want to record voice-overs
- 500 MB of free hard drive space to install software
- Optional CD burner for creating VideoCDs (VCDs) or Super-VideoCDs (S-VCDs)
- Optional DVD burner for creating DVDs

The hard drive

Your hard drive must be capable of sustained reading and writing at 4 MB/sec. Most drives are capable of this. The first time you capture at full quality, Studio will test your drive to make sure it is fast enough. Video in the DV format occupies 3.6 MB of hard drive space per second, so just four and a half minutes of DV video will consume a full gigabyte on the drive.

If disk space is a concern with your DV captures, use SmartCapture to capture your video at preview quality (see "SmartCapture: Preview-quality capture" on page 22). This feature uses much less disk space. An entire tape can fit in as little as 360 MB.

Tip: We recommend using a separate hard drive dedicated to video capture. This avoids competition between Studio and other software, including Windows, for use of the drive during capture.

Video capture hardware

Studio can capture video from a variety of digital and analog sources. Please see “Capture hardware” on page 18.

Video output hardware

Studio can output video to:

- Any DV or Digital8 camcorder or VCR. This requires an OHCI-compliant IEEE-1394 (FireWire) port (as provided by Pinnacle Studio DV). The camcorder must be set up to record from DV Input.
- Any analog (8mm, Hi8, VHS, SVHS, VHS-C or SVHS-C) camcorder or VCR. This requires Pinnacle Studio DC10plus, Studio AV, or another Pinnacle card with analog outputs. Output to analog camcorders or VCRs is also possible using a Pinnacle Studio DV or other OHCI-compliant 1394 port if your DV or Digital8 camcorder or VCR can pass a DV signal through to its analog outputs (see your camcorder manual and *Chapter 12: Making your movie*, for more information).

Abbreviations and conventions

This guide uses the following conventions to help organize the material.

Terminology

Studio: “Studio” and “Studio Plus” refer to the editing software.

DV: The term “DV” refers to DV and Digital8 camcorders, VCRs and tapes.

1394: The term “1394” refers to OHCI-compliant IEEE-1394, FireWire, DV or i.LINK interfaces, ports and cables.

Analog: The term “analog” refers to 8mm, Hi8, VHS, SVHS, VHS-C or SVHS-C camcorders, VCRs and tapes, and to Composite/RCA and S-Video cables and connectors.

Buttons, menus, dialog boxes and windows

Names of buttons, menus and related items are written in *italics* to distinguish them from the surrounding text, whereas window and dialog names are written with initial capital letters. For example:

Click the *Edit menu* button to open your menu in the Title Editor.

Choosing menu commands

The right arrowhead symbol (➤) denotes the path for hierarchical menu items. For example:

Select Toolbox ➤ Generate Background Music.

Keyboard conventions

Key names are spelled with an initial capital and are underlined. A plus sign denotes a key combination. For example:

Press CtrL+A to select all the clips on the Timeline.


Mouse clicks

When a mouse click is required, the default is always a left-click unless otherwise specified:

Right-click and select *Go to Title/Menu Editor*.

On-line help

Two kinds of immediate help are always available while you are working in Studio:

- **On-line help:** Click the *help* button  in the Studio main menu bar, or select the *Help ➤ Help topics* menu, or press F1 to open Studio's on-line help file.
- **Tool tips:** To find out what a button or other Studio control does, pause your mouse pointer over it. A "tool tip" appears explaining its function.

CHAPTER 1:

Using Studio

Creating movies with Studio is a three-step process:

1. Capture: Import source video material – your “raw footage” – to your PC hard drive. Possible sources include analog videotape (8mm, VHS etc.), digital videotape (DV, Digital8), and live video from a video camera, camcorder or webcam.

Capture mode is covered in *Chapter 2: Capturing video*.

2. Edit: Arrange your video material as desired by reordering scenes and discarding unwanted footage. Add visuals, such as transitions, titles and graphics, and supplementary audio, such as sound effects and background music. For DVD and VCD authoring, create interactive menus that give your audience a customized viewing experience.

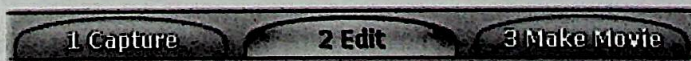
Edit mode is the arena for most of your work in Studio. See “Edit mode” later in this chapter (page 4) for a fuller introduction.

3. Make movie: When your project is complete, generate a finished movie in your choice of format and storage medium: tape, VCD, S-VCD, DVD, AVI, MPEG, RealVideo or Windows Media.

Make Movie mode is covered in *Chapter 12: Making your movie*.

Setting the mode

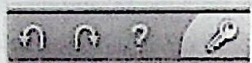
Select which step of the movie-making process you want to work on by clicking one of the three *mode* buttons at the top left of the Studio window:



When you switch modes, the Studio screen changes to display the controls needed for the new mode.

Undo, Redo, Help and Unlock

The Undo, Redo, Help and Unlock buttons are always to be found in the top right corner of the Studio window, no matter which of the three modes you are currently working in.



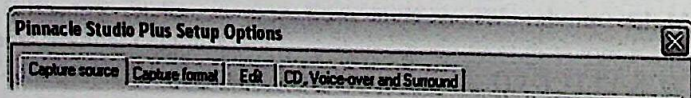
- *Undo* allows you to back out of any changes you have made to your project during the current session, one step at a time.
- *Redo* reinstates the changes one by one if you undo too far.
- The *Help* button launches Studio's on-line help system.
- The *Unlock* button lets you expand Studio by purchasing and installing premium content. (See page 9 for details.)

All other controls on the Studio screen are dedicated to tasks within the current mode.

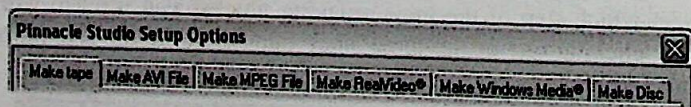
Setting options

Most options in Studio are set using two tabbed dialog boxes.

The first lets you control options related to Capture mode and Edit mode. It has four tabs:



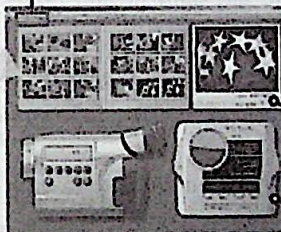
The other dialog box is concerned with options relating to Make Movie mode. It has six tabs, one for each of the six movie output types:



Each panel of both dialog boxes can be opened individually with a corresponding command on the *Setup* menu (e.g. *Setup > Capture Source*). Once either dialog box is open, however, all of its panels are available through the tabs.

1

Import video to your computer's hard drive.



The Player:

Monitor your source video

Diskometer:

Monitor dive space while caging.

2

2 Edit Mode



Digital Media Files

Video, Audio & Pictures
(AVI, MPEG, MP3, WAV, BMP, JPG)

Video and Audio Toolboxes:
Freeze-frame your clips and effects.

The Album:
Street resources for
your production.



Organize your movie, adding audio, graphics, and effects

— The Players:

Preview your movie with special effects and audio.

Timeline:

Arrange your audio and video clips.
Add special effects and transitions.

JUST DRAG AND DROP!

3

3 Make Movie Mode

Save your movie on the media of your choice.



Output Tabs:
Your options for
more detail.



States Area:
Shows states of
Federal Circuit



The Player

Preview your final movie with titles, special effects and audio.

Crust

CD: 570, DVD: 1400



Digital Movie Files:
AVI, MPEG, RealVideo or
Windows Media. Upload
your movies or share them
on the Internet.

Output to Video Tape:



For simplicity, we generally refer to the different options panels independently, as in “the *Capture source* options panel”.

Detailed explanations of the options in both dialog boxes are contained in *Appendix A: Setup Options*.



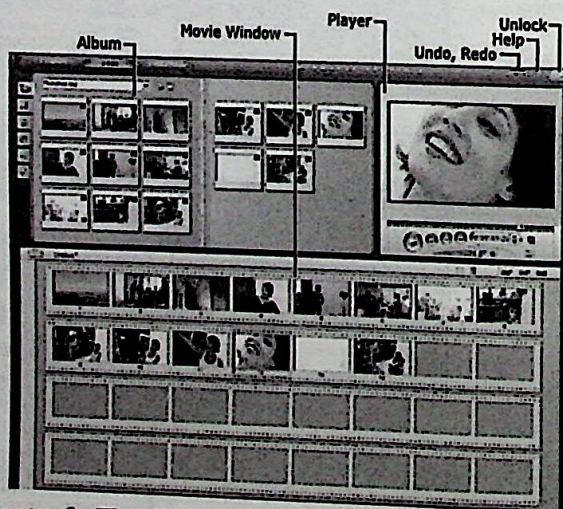
EDIT MODE

Studio opens in Edit mode each time it is launched, because that is the mode you use most often. The Edit mode display includes three main areas.

The Album stores resources you will use in your movies, including your captured video scenes.

The Movie Window is where you create your edited movie by arranging video and sound clips, and by applying transitions and effects.

The Player provides playback and previewing for whichever item is currently selected in Studio. That may be an Album resource – such as a video scene, title or sound effect – or your edited movie, complete with transitions, titles, effects and several audio tracks. The Player is covered below.



See *Chapter 3: The Album* and *Chapter 4: The Movie Window* for detailed information on those topics.

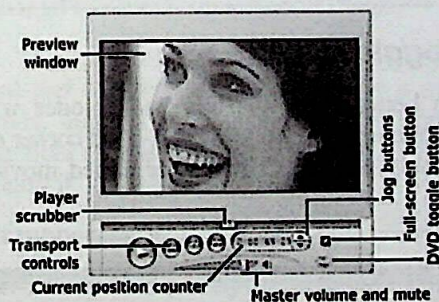
The Player

The Player displays a preview of your edited movie, or of the item currently selected in the Album.

It consists of two main areas: a *preview window* and *playback controls*. The preview window displays video images. The playback controls allow you to play the video, or go to an exact position within it. These controls come in two formats: *standard* and *DVD*.

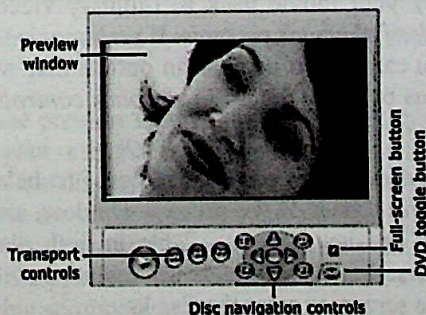
Standard mode

The standard playback controls are similar to those on a camcorder or VCR. They are used for viewing ordinary video.



DVD mode

The DVD playback controls emulate the navigation controls on a DVD player or remote control. Use them for previewing your DVD, VCD or S-VCD disc productions, including menu interaction.



The preview window

This is a point of focus in Studio because you use it so often, especially for previewing your movie. It can also be used to display:

- Any type of Album content.
- Still images or titles from your movie.
- Changes to video effects in real time while you adjust the parameter controls for the effects.
- Still frames from your video.

While viewing a still frame, you can step by as little as a single frame in either direction with the “jog” controls.

Note: The illustrations in this documentation use 16:9 (widescreen) video. When 4:3 (standard) video is previewed, the Player is proportioned somewhat differently than shown here, but its general appearance is the same.

The DVD toggle button



Switch between the two playback modes with the *DVD toggle* button at the bottom right-hand corner of the Player. This button is only available when your edited movie contains at least one menu.

Playback controls

The Player presents either of two sets of playback controls depending on the playback mode you choose.

When you play your movie back as ordinary video, you will be using the *standard playback controls*. If your movie uses disc menu navigation, you can play it back as an optical disc with interactive on-screen menus by using the *DVD playback controls*. Both groups of controls are covered below.

The full-screen preview button: This button, just below the bottom right-hand corner of the preview window, switches to a full-screen preview. It is available in both playback modes. The full-screen display ends when your movie ends, or you double-click the screen or press the Esc key.



Standard playback controls

These buttons control playback in the Player.

Play / Pause: The *Play* button previews the movie from the current position. Once preview begins, *Play* becomes *Pause*. When playback is paused, the Album scene or Movie Window clip at which previewing stopped remains selected. The **[Space]** key can also be used to start and stop playback.



Fast reverse, Fast forward: These buttons let you preview your movie at two, four or ten times the normal speed, in either direction. Use them to scan for a particular piece of video you want to work with. Click the buttons repeatedly to loop through the speed factors.



Go to beginning: This button halts playback and skips back to the first frame of the material being previewed.



Jog buttons: This pair of controls normally steps your movie forward and backward by one frame at a time. To step by seconds, minutes or hours instead of frames, select the corresponding field in the counter (see below), then use the jog buttons to modify it.



The Player scrubber

Use the Player scrubber to quickly traverse your captured video or edited movie in either direction. The scrubber position corresponds to the position of the current frame in the captured video file (*not* just the current scene) or in the edited movie (*not* just the current clip). Thus the scrubber bar always represents the entire length of the content being viewed.

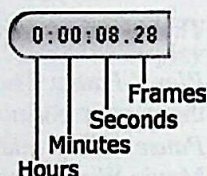


As you move the scrubber, the preview window shows the current frame.

The ability of the preview to keep up with the scrubber depends on the speed of your computer. If you move the Player scrubber slowly, the preview display responds smoothly. As you increase the rate at which you move the scrubber, the preview will jump frames. The point at which it does so depends on your hardware. The smoothness of the preview also diminishes as the overall length of the material being scrubbed increases.

The counter

The *counter* displays the current playback position in hours, minutes, seconds and frames. You can directly modify the counter fields to select an exact frame to view or at which to start playback. Simply click on the number you wish to change and type a new value. To move to a different field, click again or use the Left and Right arrow keys.



You can also modify the value in a selected field by using the jog buttons beside the counter or the Up and Down arrow keys.

The master volume slider



This control sets the overall audio volume during preview playback. It is equivalent to turning up the master volume on your sound card using the system volume tool. It does not affect the volume of the final movie Studio creates in Make Movie mode.

The small loudspeaker icon at the right of the control serves as a *master mute* button during playback.

DVD playback controls



These controls include the four standard transport buttons detailed above (*Play/Pause*, *Fast reverse*, *Fast forward*, *Go to beginning*) plus the *DVD Player Control*, which is described under "The DVD Player Control" on page 133.

Further editing topics

Please see the following for details on specific editing topics:

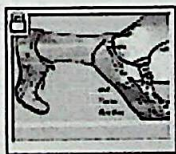
- *Chapter 5: Video clips*
- *Chapter 6: Two-track editing with Studio Plus*
- *Chapter 8: Transitions*
- *Chapter 8: Still images*

- *Chapter 9: Disc menus*
- *Chapter 10: The Title Editor*
- *Chapter 11: Sound effects and music*

Expanding Studio

One way to add pizzazz to your productions is to use a variety of video and audio filters, animated transitions, VCD and DVD menus, and sound effects.

Studio comes with comprehensive collections in all these areas, but it's also designed to grow along with your needs. When you want a particular filter, transition, menu or effect that isn't part of the basic set, an easy-to-use upgrade mechanism lets you find, purchase and install the materials you need without even leaving the program.



Some of the premium content available for Studio does not even require downloading. Studio's Bonus Content DVD includes numerous items, like the disc menu at left, that initially appear as "locked" content in Studio, symbolized by a small padlock symbol in the top-left corner of the icon. Such items can be upgraded by purchasing an unlocking code called an *activation key*. Each key unlocks a small group or *theme pack* of related content.

Additional items of locked content will be provided for download as they become available. These items can be sampled and purchased within Studio using the same activation method as for the premium content included with the program installation.

New tools, new media, new frontiers

You can purchase additional media and filters in any of three ways from within Studio:

- With the *Help > Purchase activation keys* menu command (or the *unlock* shortcut button at the top right of the Studio screen).

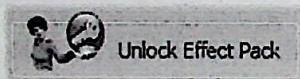


This opens a special browser window in which you can access a catalog page for any type of premium content that interests you.

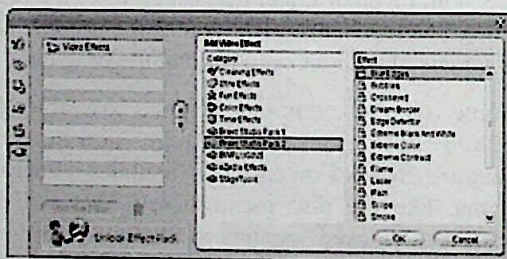
- With the Album commands *More transitions*, *More sound effects* and *More menus*.

These commands are found on the dropdown lists in the corresponding sections of the Album. They will enable you to download, try out and purchase additional premium content that was not included with the program installation.

- By clicking the *unlock theme pack* buttons found in some parts of Studio.



These buttons can be found whenever premium content is on display within Studio. The one above, when seen in the *Audio effects* tool and the *Video effects* tool, would let you unlock a pack of audio or video filters.



Here, the "Bravo Studio Pack 2" page is open in the *Video Effects* tool. The *Unlock Effect Pack* button could now be used to unlock the effects in this set.

Similar buttons in the Album let you purchase all the media on a particular Album page as a theme pack.



The *Transitions* section of the Album, open to the "HFX Family Fun 1" theme pack of *Hollywood FX transitions*. Click anywhere in the unlock panel on the right-hand page to unlock this set of transitions.

How unlocking works

“Unlocking” premium content for Studio means to obtain a license allowing you unrestricted use of the content on the single machine where Studio is installed. The licensing mechanism employs two distinct but mutually related codes:

- An *activation key* for each premium content item you purchase
- Your *Passport*, which is a number generated the first time you install Studio on your computer. You can view your Passport by selecting the *Help > My Passport* menu command.

Because the Passport is specific to one computer, you will need to obtain new activation keys if you install Studio on a different machine. These will be provided at no charge, but your user licenses for both Studio and any premium content you have obtained then apply to the new machine only.

Note: Although your Passport is specific to an individual computer, it is not affected by ordinary hardware modifications such as adding or removing expansion cards, drives or memory.

If you don't have an Internet connection...

You can purchase and apply premium content activation keys even if you don't have an Internet connection on the computer where Studio is installed. When you click one of the unlock links within Studio, a dialog will be displayed showing information needed for ordering the specific content you want, including:

- An Internet URL where you can activate the content
- Numeric identifiers for the Studio program and the item you want to activate
- Your Passport and your Serial Number

Navigate to the given URL from another computer, enter the information, and complete the purchase as directed.



CHAPTER 2:

Capturing video

Capture is the process of importing video from a video source such as a camcorder to a file on your PC's hard drive. Clips from this "capture file" can then be used in Studio as ingredients of your edited movies. You can open capture files into the Album in Studio's Edit mode (see *Chapter 3: The Album*).



Capture is the first step in using your video footage.

Studio is able to capture from both digital (DV, MicroMV) and analog video sources. See "Capture hardware" on page 18 for details on configuring Studio to capture from your equipment.

Availability: Capturing video from MicroMV camcorders is supported only under Windows XP.

Switching to Capture mode

The very first step in capturing is to switch into Studio's Capture mode by clicking the *Capture* button at the top of the screen.



This opens the Capture mode interface, enabling you to set up and carry out video capture. The details of the interface are somewhat different for analog than for digital video sources.

Topics in this chapter

- “The Capture mode interface” (below) introduces the controls and displays for both analog and digital captures.
- “The Capture Process” (page 17) covers setting up for your hardware, gives step-by-step capturing instructions, and describes the *automatic scene detection* feature.
- “Digital capture” (page 22) and “Analog capture” (page 26) cover topics specific to each type of source.

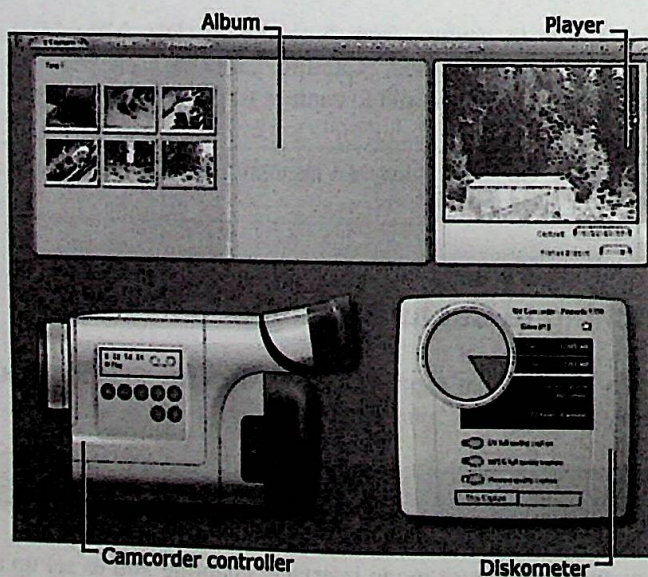


THE CAPTURE MODE INTERFACE

The tools and controls you see in Capture mode are different depending on whether your capture hardware is digital or analog.

Digital capture

If your video source is digital, your Capture mode screen will look like this:



The Album, at the top left of the screen, displays icons representing the video scenes as they are captured. The Player, at top right, lets

Digitized by Arya Samaj Foundation Chennai and eGangotri
you view the incoming video while cueing for capture, and monitor the capture itself. Readouts on the Player tell you the exact length of the captured video, and the number of frames dropped during the capture (normally zero).

The Camcorder Controller, at bottom left, provides a tape counter display and a set of transport controls for operating the playback device. Finally, the Diskometer, at bottom right, displays the capture space remaining on the drive. It also provides the *Start Capture* button and buttons for setting capture options.

The Diskometer and the Camcorder Controller are described in detail beginning on page 16.

Analog capture

Both the Album and the Player are used in analog as well as digital captures, so when you capture from an analog source the top half of the screen is the same as shown and described above for digital sources.

Not the bottom half of the screen, however. It now features a second version of the Diskometer, with two fly-out panels for adjusting audio and video levels during capture. (The panels are described under “Audio and video levels – analog” on page 26.)



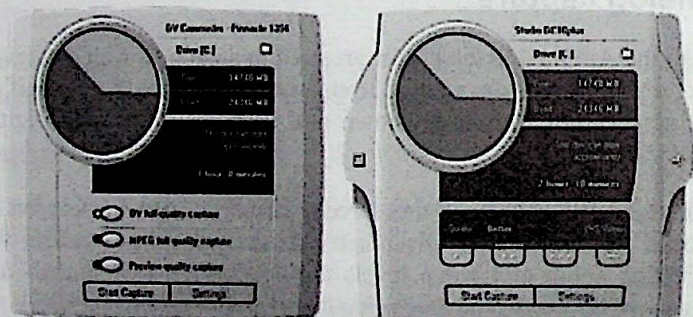
Digital vs. analog

To summarize, the digital and analog setups reflect two major differences in capability:

- The digital setup lets you control the tape transport of the camcorder or VCR using the Camcorder Controller.
- The analog setup lets you modify audio and video levels dynamically during capture.

The Diskometer


The Diskometer displays, both numerically and graphically, the amount of space available on your capture drive. It also indicates the approximate duration of video that can be accommodated, which depends on both the available space and the configured *capture quality*. Capture quality settings are selected using the *preset* buttons that are displayed on the Diskometer for some capture devices, or by entering custom settings. See “Capture source settings” (page 198) and “Capture format settings” (page 201) for information on capture settings.



The Diskometer when capturing from a digital source (L) and an analog source (R). Click the side tabs on the analog version to open fly-out panels for adjusting video and audio levels during capture.

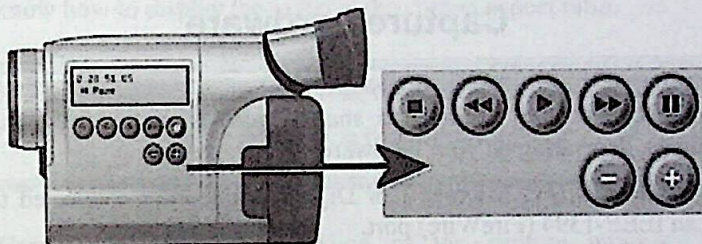
The *Start capture* button on the Diskometer begins and ends the capture process. The caption changes to *Stop capture* while the operation is in progress.

The default save location for captured video is your system's *Shared video* directory.

Setting the capture directory: To save captured video to a different location, click the *file folder* button . This displays the Select Folder And Default Name For Captured Video dialog. The folder you assign will be used to store captured video during this and future sessions. The file name you enter will be offered as the default file name on your next capture.

The Camcorder Controller

This panel of transport controls is shown in Capture mode if you are capturing from a digital video source. (Analog devices must be cued and operated manually.)



The Camcorder Controller and a close-up view of the transport controls. The counter window above the control buttons displays the current position of the source tape, along with the current transport mode of the camcorder.

From left to right, the transport control buttons are: *Stop, Rewind / Review, Play, Fast forward / Cue and Pause.*

The *Frame reverse* and *Frame forward* buttons (second row) let you locate the exact frame you want. These two buttons are available only when the device is in pause mode.



THE CAPTURE PROCESS

Studio lets you capture video from a variety of analog and digital hardware types. Choose the device you wish to use on the *Capture source* options panel. See “Capture hardware” (below) for more information.

Performing the actual capture is a straightforward step-by-step procedure (see page 19). As the capture proceeds, Studio automatically detects the natural breaks in the incoming video and divides the material into “scenes”. Upon detection, each scene is

added to the Album, where it is represented by an icon of its first frame. Automatic scene detection is described starting on page 21.

Some capture options apply to digital captures only or to analog captures only. These are covered in their own sections, "Digital capture" (page 22) and "Analog capture" (page 26).

Capture hardware

Studio can capture digital and analog video from the following sources, depending on your hardware:

- **Digital:** A DV, MicroMV or Digital8 camcorder connected to an IEEE-1394 (FireWire) port.
- **Analog:** A camcorder or VCR with analog outputs connected to a DirectShow-compatible capture board or external device.
- **Analog:** A USB video camera or webcam.

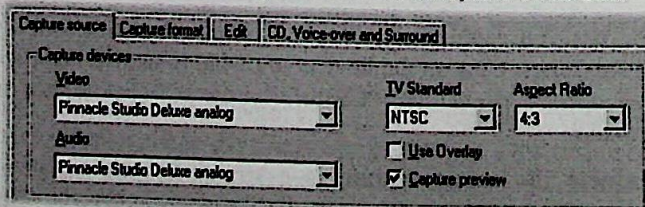
Availability: Capturing video from MicroMV camcorders is supported only under Windows XP.

Pinnacle Systems offers a complete line of DV, analog, and combination capture boards and devices. For more information see your dealer or visit our web-site:

www.pinnaclesys.com

To select a capture device:

1. Click the *Setup* > *Capture Source* menu command.
The *Capture source* options panel appears.
2. Select the devices you want to use from the *Video* and *Audio* dropdown lists in the *Capture devices* area, and click *OK*.



See "Capture source settings" on page 198 for detailed information about the *Capture source* options panel.

Standard vs. widescreen capture

Studio can capture in both the standard (4:3) and the widescreen (16:9) frame aspect ratios. With digital hardware, the frame format is detected automatically. With analog hardware, you use the *Aspect ratio* dropdown on the *Capture source* options panel to select the format that matches the source material. You can't use this setting to change one format to another: it simply lets Studio know how to display the video at the correct aspect ratio.

Capture step-by-step

Here is a step-by-step outline of the capture process. The instructions apply to both digital and analog captures, with differences noted as required.

Further information relating to some of the steps can be found elsewhere in this chapter. Also see *Appendix A: Setup Options* (page 197) for detailed descriptions of the *Capture source* and *Capture format* options panels.

To capture video:

1. Verify that your equipment is properly connected.

For a digital (DV or MicroMV) capture, your camcorder or VCR must be connected to your PC's 1394 port.

For an analog capture, connect the source video to the Composite or S-Video input of your capture hardware. Connect your source audio to the audio input of the capture hardware, if there is one; otherwise, connect the audio to the audio input of your PC's sound card.

2. Click the *Capture* button at the top of the screen if you are not already in Capture mode. The Capture mode interface is displayed (see page 14).
3. Click the desired capture setting on the Diskometer. If you need to make detailed adjustments, click the Diskometer's *Settings* button, which opens the *Capture format* options panel (page 201).

For a DV capture, keep in mind that full-quality capture uses much more disk space than does preview quality. If you are

planning to output your finished movie to disc (VCD, S-VCD or DVD), you may choose to make your full-quality capture in MPEG rather than DV format.

For an analog capture, keep in mind that the higher the quality setting, the larger will be your captured video file. See “Digital capture” (page 22) and “Analog capture” (page 26) for further explanation of these options.

4. Click the *Start capture* button on the Diskometer.

The Capture Video dialog box is displayed.

5. Type in a name for the video capture file you are about to create, or accept the default name. You can optionally also enter a limiting duration for the capture.

If you are making multiple DV captures in preview quality from the same tape, use the file naming convention described on page 23. It will help streamline the Make Movie process later on.

Note: Windows 98 and Millennium have file size limitations. For FAT16 disks the limit is 2 GB. For FAT32 disks the limit is 4GB. Studio estimates how much video of the desired quality the largest allowable file can accommodate, and displays this as the maximum duration for the capture.

6. If you are capturing from an analog camcorder or VCR, start playback now. This step is unnecessary with a digital-source capture, as Studio will control the playback equipment automatically when needed.
7. Click the *Start capture* button in the Capture Video dialog box. The button caption changes to *Stop capture*.

Capture begins. The Player displays the incoming digitized video that is being saved to your hard drive (unless you have unchecked *Capture preview* on the *Capture source* options panel).

During capture, Studio performs *automatic scene detection* based on the current setting in the *Capture source* options panel.

8. Click the *Stop capture* button to end capture at a point you select.

Studio automatically stops capturing if your hard drive fills up or the maximum duration you entered is reached.

Scene detection

Automatic scene detection is a key feature of Studio. As video capture proceeds, Studio detects natural breaks in the video and divides it up into *scenes*. A new icon is created in the Video Scenes section of the Album for each scene detected.

Depending on which capture device you are using, automatic scene detection is carried out either in real time during capture, or as a separate step immediately after capture is completed.

You can configure scene detection using the options under *Scene detection during video capture* on the *Capture source* options panel (*Setup > Capture Source*). Not all scene detection options are available with every type of video source. Options that do not apply to your setup are disabled in the dialog.

The four possible options are:

- **Automatic based on shooting time and date:** This option is available only when you are capturing from a DV source. Studio monitors the time stamp data on the tape during capture, and starts a new scene whenever a discontinuity is found.
- **Automatic based on video content:** Studio detects changes in the video content, and creates a new scene wherever there is a large change in the images. This feature might not work well if the lighting is not stable. To take an extreme example, a video shot in a nightclub with a strobe light would produce a scene each time the strobe flashed.
- **Create new scene every X seconds:** Studio creates new scenes at an interval you choose. This can be useful for breaking up footage that contains long continuous shots.
- **No automatic scene detection:** Select this option if you want to monitor the entire capture process and decide for yourself where scene breaks should occur. Press the **[Space]** key each time you want to insert a scene break during capture.

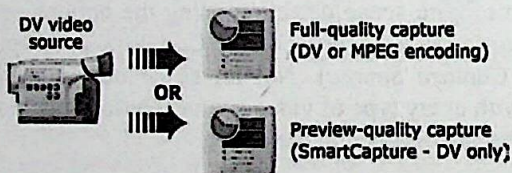


DIGITAL CAPTURE

This section covers aspects of capturing from a DV source deck (camcorder or VCR) and a 1394 port. To read about capturing from analog hardware, please see “Analog capture” on page 26.

Preview quality and full quality

When capturing in DV format from a DV device, Studio offers the choices of preview quality (SmartCapture) and full quality. At full quality, two types of encoding are available: DV and MPEG.



The two DV capture quality choices are covered in detail in the following pages. This section concludes with a note on adjusting audio and video levels in digital captures (page 25).

Note: If you are using a MicroMV camcorder connected to a 1394 port, the user interface in Capture mode is almost identical to that for DV equipment. However, most DV capture options and features are not available with MicroMV captures, including preview-quality capture and DV encoding. Captures from MicroMV are always encoded as MPEG-2. MicroMV is supported only under Windows XP.

SmartCapture: Preview-quality capture

SmartCapture is a unique feature of Studio. It allows you to capture from DV videotape to a file of reduced-quality video using minimal hard drive space. With SmartCapture, you can capture an entire tape onto your hard drive rather than having to pick and choose which portions to capture. You can work with this “preview-quality” material throughout the editing of your movie.

When your movie is finished and ready for output, Studio will recapture any preview-quality clips at full quality, automatically controlling your source deck to locate and capture the footage. The reduced quality of the preview video therefore has no impact on the quality of your finished movie. Scenes captured at preview quality are denoted in the Album by a dotted border.

Continuous timecode

For the greatest convenience in using SmartCapture, your digital tape must have continuous DV timecode. Studio cannot capture in preview quality through breaks in the timecode. If your camcorder has a timecode-stripping feature, stripe your tape before shooting. If it does not, the simplest way to avoid timecode gaps is to overlap your shots if you start and stop the camcorder during shooting. Before beginning a new shot, rewind a few frames so that there will not be a blank spot.

SmartCapture can still be used with tapes that do not have continuous timecode throughout, but a separate capture file must be created for each segment of the tape. SmartCapture will stop capturing when a break in timecode is detected. To continue capturing, cue the tape to the start of the next video segment and click *Start Capture* again.

Naming convention

If you capture multiple segments from the same tape, we strongly recommend the following naming convention: *For each capture file that originates from the same tape, use a name that starts with the same word.*

For example, if you have a tape that contains three different activities from your vacation, you might call the captures “vacation-picnic”, “vacation-sailing” and “vacation-soccer”. Because Studio processes the files in alphabetical order when recapturing, following this convention will greatly reduce the number of times you have to switch tapes during the Make Tape process.

Analog tapes and Digital8 camcorders

SmartCapture requires DV timecode. Analog tapes (Hi8 and 8mm) do not have DV timecode even when played in a Digital8 camcorder. As a result, it is not possible to use SmartCapture with analog tapes played in a Digital8 camcorder. To use your analog tapes with Studio, either capture them at full quality, or copy them to DV tape.

Full-quality capture

You have two choices for the way the video data is encoded and compressed in full-quality captures. For most purposes, DV format is the logical choice, but if you are planning to output your finished movie to disc (VCD, S-VCD or DVD), you may prefer the MPEG-1 or MPEG-2 format instead.

Because of the intensive computation required for MPEG-2 encoding, older computers may not be fast enough to achieve a satisfactory MPEG-2 capture. The type of capture hardware you have and the capture quality you choose also help determine the minimum CPU speed needed. In cases where Studio is able to estimate that your computer is not fast enough to carry out a particular capture, it will advise you of the problem and give you a chance to cancel the operation.

An MPEG movie requires much less disk space than the equivalent full-quality DV movie, although thanks to SmartCapture this is not generally a concern.

DV

DV is a high-resolution format with correspondingly high storage requirements.

Your camcorder compresses and stores video on the tape at 3.6 MB/s, at a quality equivalent to broadcast video. With full-quality capture, the video data is transferred directly from the camcorder tape to your PC hard drive with no changes or additional compression. Because the video quality is high, capturing at this setting does consume a lot of disk space, so you may want to pick and choose small segments to capture instead of the entire tape.

You can calculate the amount of disk space you will need by multiplying the length of your video in seconds by 3.6, which gives the number of megabytes required. For example:

1 hour of video = 3600 seconds (60 x 60)

3600 seconds x 3.6 MB/s = 12,960 MB (12.7 GB)

Hence 1 hour of video uses 12.7 GB of storage.

To capture at full quality, your hard drive must be capable of sustained reading and writing at 4 MB per second. All SCSI and

most UDMA drives are capable of this. The first time you initiate a full-quality capture, Studio will test your drive to make sure it is fast enough.

MPEG

DVD and S-VCD discs both use files in MPEG-2 format, an extension of the MPEG-1 format used for VCDs. MPEGs intended for use on the Internet will be at lower resolutions and in MPEG-1 format.

The *Capture format* options panel (*Setup > Capture Format*) includes a variety of options to control the quality of MPEG captures. Refer to “Capture format settings” on page 201 for detailed information about MPEG quality options.

Audio and video levels – digital

With DV and MicroMV captures, you are using audio and video that have been encoded digitally during recording, right in the camera. When you transfer the footage through a 1394 port to your computer, the data remains in the compressed digital format throughout, so you cannot adjust the audio or video levels during the capture. This is in contrast to analog captures, where the audio and video *can* be adjusted as capturing takes place.

With digital captures, you defer any needed adjustment of audio and video levels until Edit mode, where Studio provides plug-in video effects for adjusting the visual balance of a clip, and audio effects to enhance the sound. These effects allow you to adjust individual clips rather than having to make global adjustments affecting all the video in a capture file.

For more information see “Analog capture” (below), “Using video effects” (page 79), and “Audio effects” (page 176).



ANALOG CAPTURE

The topics in this section relate to capture with analog equipment, such as:

- A camcorder or VCR with analog outputs connected to a DirectShow-compatible capture board or external device.
- A USB video camera or webcam.

If you are using a DV or MicroMV camcorder connected to your computer via a 1394 port, please refer instead to “DV capture” on page 22.

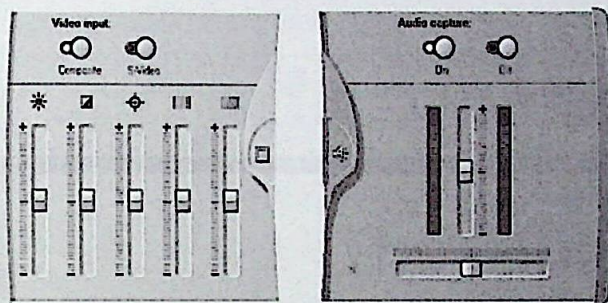
Capture quality options

With most analog capture hardware, Studio offers three preset quality choices – *Good*, *Better* and *Best* – plus a *Custom* option. Your hardware’s capabilities determine how the presets translate into particular settings for picture size, frame rate, compression characteristics and quality. Keep in mind that the higher the quality, the more disk space is required. Choose the *Custom* preset to configure your own video capture settings. For more information on video capture settings, see *Appendix A: Setup Options* (page 201).

Audio and video levels – analog

Studio provides fly-out panels for controlling video and audio levels during capture. This feature is especially useful when you need to compensate for differences in video captured from multiple sources.

Although you can also adjust these levels with the appropriate *Video effects* in Edit mode, setting them correctly for capture can save you from having to worry about color correction later on.



Video (L) and audio (R) panels for setting levels during analog capture.

Setting your audio options correctly as you capture will help in achieving consistent volume levels and quality.

Particular capture devices may offer fewer options than are shown and discussed here. For instance, with hardware that doesn't support audio captures in stereo, a balance control will not appear on the audio panel.

Video

Choose the type of video you are going to digitize by clicking the appropriate *Source* button (*Composite* or *S-Video*). The five sliders allow you to control the brightness (video gain), contrast (black level), sharpness, hue and color saturation of the incoming video.

Note: The *Hue* slider does not appear when capturing from PAL equipment.

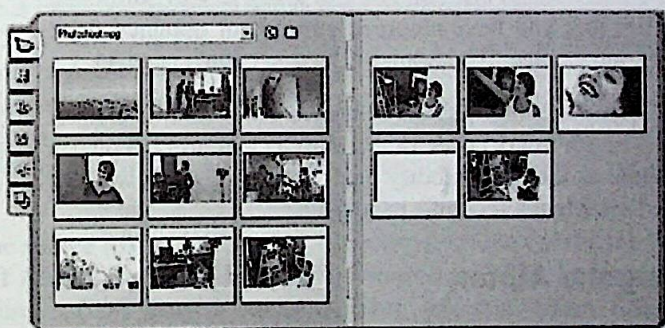
Audio

Use the *Audio capture* buttons to control whether Studio should capture the audio along with the video. Select the *Off* button if your source is video only. The sliders on the tray let you control the input level and stereo balance of the incoming audio.



CHAPTER 3:

The Album



The Video Scenes section of the Album. Click the tabs down the left side of the Album to access the materials in the other sections.

The source materials you need for making a movie are stored in the various sections of the Album, each of which is accessed by its own tab as follows:

Video Scenes: This section contains your captured video footage. You can access and preview the capture files directly, or you can load one into the Album, where its scenes are represented by thumbnail icons. To use some of the scenes in your movie, just drag their icons into the Movie Window. See “The Video Scenes section”, page 31.



Transitions: This Album section contains fades, dissolves, slides, and other transition types, including the elaborate Hollywood FX transitions. To use a transition, position it next to or between video clips and graphics in the Movie Window. See “The Transitions section”, page 41.



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Titles: This section contains editable titles, which you can use as overlays or as full-screen graphics. You can create your own titles from scratch, or use or adapt the supplied ones. Studio supports rolls, crawls, and many typographical effects. See “The Titles section”, page 43.



Still Images: This is a section of photographs, bitmaps and grabbed video frames. You can use these images full-screen or as overlays on the main video. Most standard image file formats are supported. See “The Still Images section”, page 44.



Sound effects: Studio comes ready with a wide range of high-quality sound effects. You can also use wav, mp3 and avi files that you have recorded yourself or obtained from other sources. See “The Sound Effects section”, page 44.



Disc Menus: Studio has an extensive collection of chapter menus to use in DVD, VCD and S-VCD authoring. You can use these as they are, modify them, or create your own. See “The Disc Menus section”, page 46.



Using the Album

Each section of the Album contains as many pages as are necessary to hold the icons representing the items in that section. At the top right of each Album page, Studio shows the current page number and the total page count for the section. Click the arrows to move forward or back through the pages.

All types of Album content can be previewed simply by clicking on the icons.

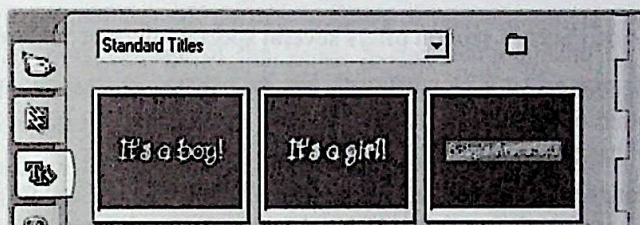


This chapter introduces each of the Album sections in turn, beginning with a detailed discussion of the all-important Video Scenes section. Actually using the contents of the Album to create your edited movie will be the subject of chapters 4 through 11.


Source folders for Album content


The scene icons in the Video Scenes section come from a captured video file, while the Transitions section is filled from resource files associated with the Studio program.

The icons in each of the other four Album sections are different: they represent the files contained in a particular disk folder. Each of these sections – Titles, Images, Sound Effects and Disc Menus – has a default folder assigned to it, but you can select a different folder if desired.



The icons in the Titles section represent files stored in a selected source folder on your hard drive. The dropdown list at the top of the Album page lets you select either "Standard Titles" or "My Titles" from the installed "Titles" folder. The folder button beside the list lets you look elsewhere on your hard drive. The Disc Menus section works similarly.

The source folder for the section's content is listed at the top of the left Album page, next to a small *Folder* button . To change the source of the current section, either select a folder from the dropdown or list, or click the button, browse to another folder on your system, and select any file. The file you select will be highlighted in the repopulated Album section.

Some Album sections also provide a *Parent folder* button  to facilitate moving around within a group of folders containing appropriate media.



THE VIDEO SCENES SECTION



This is where the editing process really begins – in the Video Scenes section of the Album with your captured raw footage. In a typical production, your first step will probably be to drag some scenes from the Album down into the Movie Window (see *Chapter 5: Video Clips*).

In the Album, scenes are displayed in the order in which they were captured. This order cannot be changed, since it is determined by the underlying capture file, but scenes can be added to your movie

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in any order you choose. Similarly, while you can't trim (edit) Album scenes, you can use any desired portion of a scene when it appears as a clip in your movie.

Interface features

The Video Scenes section offers several special interface features:

- The icons of scenes captured at preview quality are drawn with a dotted outline in the Album. Scenes captured at full quality do not have this outline.
- Scenes that have been added to the Movie Window are distinguished in the Album by a green checkmark. The checkmark remains as long as any clip in the Movie Window originates with that scene.
- To see how a particular Album scene is used in your current project, use the *Album > Find Scene in Project* menu command. Studio highlights any clips in the Movie Window that originate in the selected scene (or scenes). To go the other way, use the *Find Scene in Album* command, which is on the right-click menu for Movie Window clips.
- Nearly all menu commands that apply to scenes are available both on the main *Album* menu, and on the pop-up menu that appears when you right-click a selected scene. When this documentation calls for a menu command like *Album > Combine Scenes*, remember that an equivalent command is usually available on the pop-up "context" menu as well.

Summary of operations

Because of its central role, the Video Scenes section of the Album provides an extensive set of operations. These are covered below in the following topics:

- Opening a captured video file
- Viewing captured video
- Selecting scenes and files
- Displaying scene and file information
- Comment view
- Combining and subdividing scenes
- Redetecting scenes

Opening a captured video file

The default locations for your video files are the Windows default capture folder and the *My videos* folder. When you are viewing the *folder contents* page of the Video Scenes section, both of these locations always appear on the dropdown list at the top of the Album.

You can also choose other hard drive folders to access stored video files. Both the current and previous folders are also listed, if they are different from the two standard locations, making four different folders that may appear in the list at any one time.

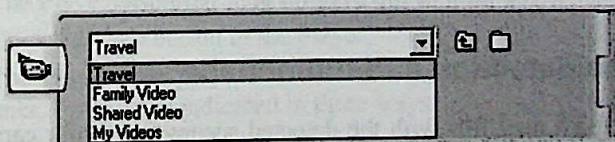
Under Windows XP, the system capture folder is located in the Windows' "all users" documents folder. The capture folder's real name is *My videos*, but Windows Explorer and Studio customarily call it by an alias, *Shared videos*. This distinguishes it from *My videos* in the user's personal documents folder.

Under versions of Windows with no special shared video folder, the default capture folder is called:

C:\My Documents\Pinnacle Studio\Captured Video

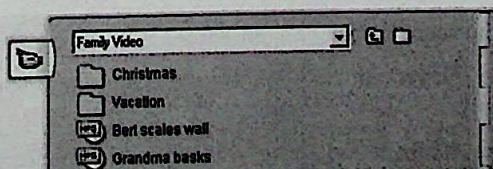
Under Windows 98, the full pathname of the *My Videos* folder is:

C:\My Documents\My Videos



Opening a folder

The *folder contents* page is displayed whenever you choose a new folder. It lists both the subfolders and the digital video files within the folder you chose:



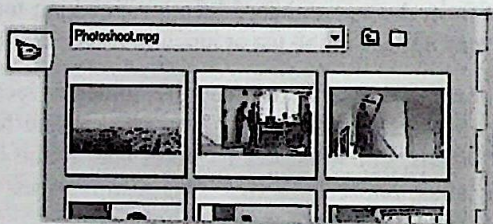
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Three ways to open a folder:


- Select the folder name on the dropdown list on the *folder contents* page.
- Select a folder listed on the *folder contents* page.
- Click the *parent folder* button.

Opening a file

When you open a video file, the *file contents* page is displayed, showing icons that represent the scenes in the file:



Three ways to open a digital video file:

- Select the file name on the dropdown list on the *file contents* page.
- Double-click a file listed on the *folder contents* page.
- Click the *browse for file* button  and use the Open dialog to locate an avi, mpg or mp2 file on your hard drive.

Scene detection and thumbnails

The Album now fills with the detected scenes from your captured video (see “Scene detection” on page 21). Each scene is denoted by a thumbnail frame – an icon of the scene’s first frame. It may be that the first frame doesn’t make a good icon for the scene, so Studio lets you pick a different one if desired.

To change thumbnails in the Album:

1. Select the scene to be changed.
2. Use the Player to find the frame you want used for the thumbnail.
3. Click the *Album > Set Thumbnail* menu command.

Video aspect ratios

Most digital video files provide format information that allows Studio to detect the frame aspect ratio of 4:3 or 16:9 automatically. If the file does not provide aspect ratio information, Studio defaults to the standard 4:3 format.

The *Aspect Ratio 4:3* and *Aspect Ratio 16:9* commands on the *Album* menu let you manually set whichever ratio you need. These commands also appear on the right-button context menu for video scenes in the Album.

Studio does not allow you to mix footage of different aspect ratios in the same movie. If you want to add 16:9 footage to a 4:3 movie, or 4:3 footage to a 16:9 movie, you must first use whichever *Aspect Ratio* command is needed to bring the Album scenes into conformity with the movie. The new clips will be squeezed or stretched as needed to match the movie.

Viewing captured video

Individual or multiple scenes in the open captured video file can be viewed at any time.

To view captured video starting at a selected scene:

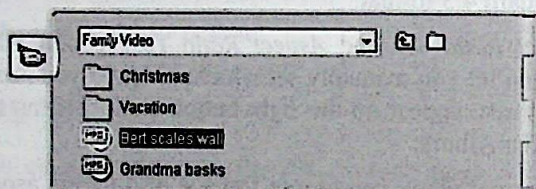
1. Click on the scene's icon in the Album.
The Player displays the first frame of the selected scene.
2. Click the *Play* button in the Player.
The Player now plays the selected scenes and any subsequent ones. Progress is indicated in three ways.
 - The scenes highlight successively as they are played.
 - The Player scrubber shows the current point of play relative to the entire movie.
 - Scene thumbnails display a progress bar during preview. As you continue to view your captured video, the progress bar moves from one thumbnail to the next.



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Previewing digital video files

When a folder is open in the Album and the name of a digital video file is selected, you can use the Player to preview the video without actually opening the file into the Album.



You can even select multiple files for playback using standard selection techniques.

Selecting scenes and files

Studio offers a variety of ways to select scenes and other items in the Video Scenes section of the Album. Selected video scenes are indicated by a highlighted border. Selected folders and video files are shown with text highlighting.

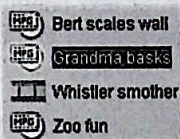


Selected scenes have a highlighted border (center).

Selection techniques follow standard Windows conventions. Use any of the following, separately or in combination:

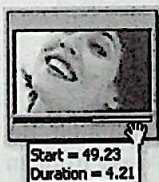
- Choose the **Edit > Select All** menu command or press **Ctrl+A** to select all the scenes (or files and folders) currently displaying in the Album, including those on other pages.
- **Shift-click** to select a range of neighboring items.
- **Ctrl-click** to add or remove individual items from the selection.
- Starting with the mouse pointer over a blank area of the Album page, click and drag to "marquee" an area, selecting all the items that intersect the area.

- Use the arrow keys to navigate the Album grid. Use the arrows in combination with Shift to select items as you go.



Selected folders and video files have highlighted text.

Displaying scene and file information



As you move the mouse pointer over video scenes, the pointer changes to a grabber symbol. If you pause momentarily on the scene, the start time and length is displayed in a pop-up box. If you leave the grabber on the scene, the display persists for several seconds. The start time shown is the timecode from the original source video, in minutes, seconds, and frames.

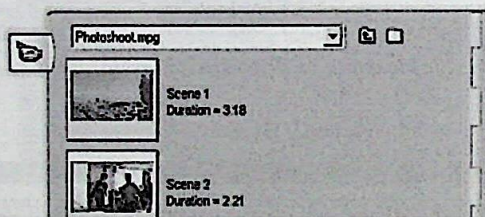


For information regarding video files when the Video Scenes section is in *folder view* mode, select *Details view* in the Album's right button context menu. The file name, resolution, aspect ratio, duration and frame rate are displayed. Switch back to a more compact listing with *Icon view*.

Comment view

In the default view for the Video Scenes section, known as *Scene view*, each scene is represented by a thumbnail frame icon. To see more information about each scene, use the *Album > Comment View* menu command.

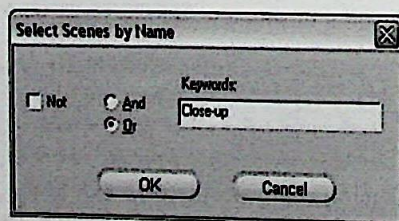
In comment view, editable captions are displayed for Album scenes. The usage of these captions is up to you: they might be search keywords, or scene names, or text comments describing the scene content. The default caption is generated from the scene's sequence number and duration (e.g. "Scene 3, 7:21").



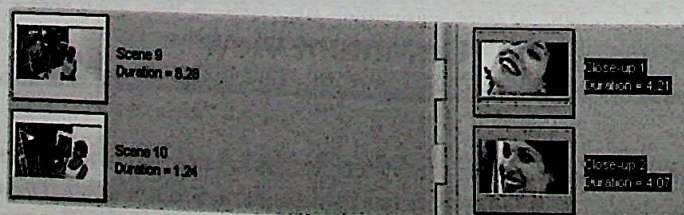
If you click on a video scene, an in-place text field appears, allowing you to enter the custom name or comment.

Selecting scenes by name

A related option lets you select video scenes by scanning for keywords in the comments. Use *Album* > *Select By Name* to open this dialog box:



Enter a keyword into the text field and click *OK* to highlight all Album scenes whose caption contains the keyword. The default captions are *not* searched – only the ones you have customized.



Combining and subdividing scenes

After previewing your scenes, you might want to combine or subdivide some into larger or smaller units. Such adjustments are easily made.

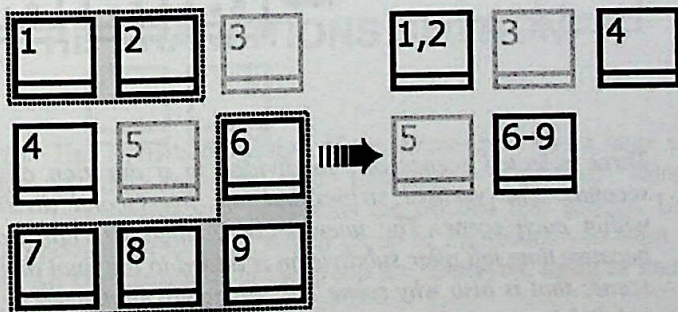
To combine scenes in the Album:

1. Select the scenes to be combined.
2. Select *Album* ➤ *Combine Scenes*.

The selected scenes are combined into one.

Only selected adjacent scenes can be combined. Furthermore, they are joined in the order in which they appear in the Album, regardless of the order in which they were selected. (Album order proceeds across rows and then down the page.) To revert, press Ctrl+Z, or click the *undo* button.

If the scenes you selected were not all neighbors, each set of adjacent scenes is combined, but the different sets are *not* combined with each other.

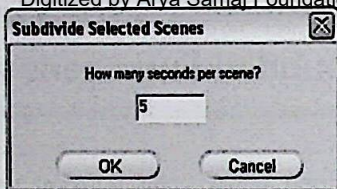


Several selected scenes (black) are merged into two longer scenes. Having no neighbors, scene 4 is unaffected, even though it was part of the selection.

To subdivide scenes in the Album:

1. Select the scenes to be subdivided.
2. Select *Album* ➤ *Subdivide Scenes*.

The *Subdivide Selected Scenes* dialog box appears.



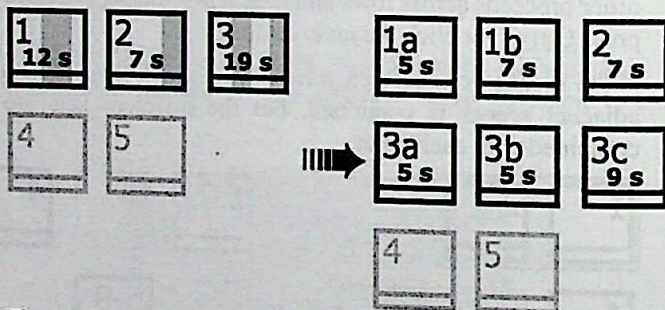
3. Choose the length of the subdivided scenes by typing in a value.

The smallest allowed subdivision is one second. Any video remaining after subdivision is added to the last scene.

4. Click *OK*.

A progress bar appears, the scene is subdivided, and new scenes are added to the Album. To revert, press Ctrl+Z, or click the *undo* button.

You can subdivide these scenes still further, if desired, down to the minimum duration of one second.



Three selected scenes are subdivided to a duration of five seconds. The vertical stripes indicate five-second divisions within each scene. The uneven clip timings at right occur because time left after subdivision is added to the final divided scene; that is also why scene 2 is ultimately unaffected by the subdivision operation.

Redetecting scenes

If you combine or subdivide scenes and later decide that you'd prefer to restore them to their original state, you may redetect any

scene or selection of scenes. The detection results are identical to those obtained after capturing, provided the same scene detection technique is used.

If you have subdivided scenes, you must first recombine them. Even if you cannot exactly recall the initial state and so recombine more than is necessary, the detection process will restore the original scene sequence.

To redetect scenes:

If you need to recombine any scenes, first select the subdivided scenes, then apply the *Album > Combine Scenes* menu command.

1. Select the scenes you wish to redetect.
2. From the *Album* menu, select either *Detect Scenes by Video Content* or *Detect Scenes by Shooting Time and Date*.

A progress window appears as Studio detects the scenes and repopulates the Album.

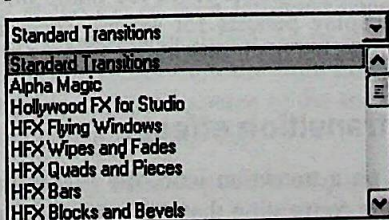


THE TRANSITIONS SECTION



The Transitions section of the Album provides a large set of drag-and-drop clip transitions. To keep things manageable, the transitions are divided into groups. Use the dropdown list to select which group of transitions you want to view. All the transitions in the group are displayed, using as many Album pages as necessary.

To learn about transitions, and how you can use them in your movies, see *Chapter 7: Transitions*.



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Studio's transitions collection includes 74 standard transitions, 52 Alpha Magic transitions, 16 unrestricted Hollywood FX 3-D transitions, and many more "locked" Hollywood FX transitions (with a padlock symbol in the top-left corner of the transition icon).

Using the locked transitions

These demo transitions are freely available for you to try, but a Studio 9 "watermark" will be superimposed on part of the video frame during playback. To make use of these transitions in an actual production, simply open the Album to the desired transition, then click in the *unlock* panel on the same Album page. You can purchase an *activation key* in just a few minutes, with no need to exit Studio.



The Transitions section of the Album, open to the "HFX Family Fun 1" theme pack of Hollywood FX transitions. Click anywhere in the unlock panel on the right-hand page to unlock this set of transitions.

For more information about purchasing premium content for Studio, see "Expanding Studio" on page 9.

Displaying the transition name

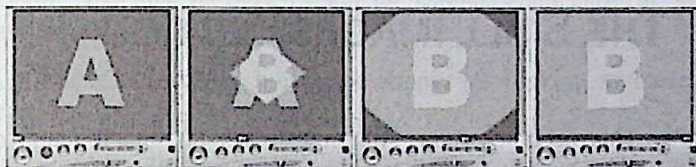


As you move the mouse pointer over the transition icons in the Album, the pointer changes to a grabber symbol (indicating that the transition can be dragged from the Album to the Movie Window). If you pause momentarily on the icon, the name of the transition is displayed. The display persists for several seconds or until your mouse pointer moves off the transition.

Previewing transition effects

When you click on a transition icon, the Player demonstrates the transition using the convention that "A" represents the original clip

and “B” the new clip. The demonstration cycles for as long as the icon remains selected.



To see a detailed view, stop the Player and use the jog buttons (*Frame reverse* and *Frame forward*) to step through the transition one frame at a time.



THE TITLES SECTION



This section of the Album contains a collection of text titles in a variety of styles. They can be used in your movie as either *full-screen* or *overlay* titles. The difference is that in an overlay title the transparent background is replaced by other material (usually a video clip), whereas in a full-screen title, the background is replaced with black.



In the Album, a gray checkerboard is used to indicate the portion of a title that will be treated as transparent in overlays. As with video scenes, titles that have been added to your current project are indicated in the Album by a green checkmark symbol.

With Studio’s powerful built-in Title Editor, you can readily create your own titles when needed. However, you may find it easier still to start with one of the supplied titles and customize it in the Title Editor.

The Titles folder: The icons in the Titles section represent files in the folder named at the top of each left-hand page in the section. Titles that you have created or modified can be added to the section by saving them into this folder from the Title Editor. You can also select a different folder to be the source of the section (see “Source folders for Album content” on page 30).

For information on using titles in your movie, see *Chapter 8: Still images*.

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THE STILL IMAGES SECTION



This section of the Album displays thumbnail icons of image files, which may include grabbed video frames, photographs and bitmapped drawings. Most standard image file formats are supported. As with video scenes, images that are in use in your current movie are indicated by a green checkmark symbol.

The Still Images folder: The icons in the Still Images section represent files in the folder named at the top of each left-hand page in the section. Images can be added to the section by storing them in this folder. For instance, you can save grabbed video frames into the folder from the *Frame grabber* tool, or save a title from the Title Editor. You can also select a different folder to be the source of the section (see “Source folders for Album content” on page 30).

For information on using still images in your movie, see *Chapter 8: Still images*.



THE SOUND EFFECTS SECTION



Studio comes with a wide range of ready-to-use sound effects. These wav files are installed into a number of folders, covering categories such as “animals”, “bells” and “cartoons”.

The Sound Effects folder: This section of the Album displays the sound files contained in one disk folder, named at the top of each left-hand page in the section. You can display the sounds in a different folder – not necessarily one of those installed by Studio – by selecting a different folder to be the source for the section (see “Source folders for Album content” on page 30).

Besides wav (Windows “wave”) files, music files in mp3 format and avi animation files are also displayed in this section of the Album, and may be drawn upon for supplemental audio in your productions.

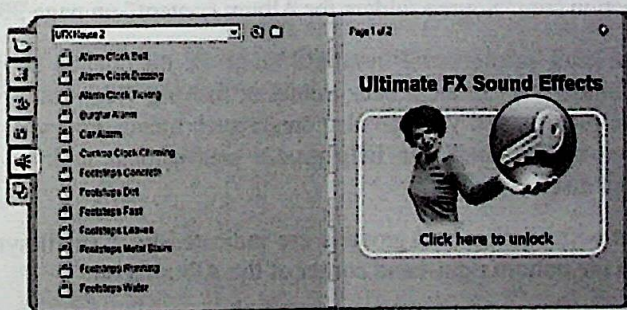
Any sound clip can be previewed simply by clicking its name or icon.

For information on using sounds in your movie, see *Chapter 11: Sound effects and music*.

Along with the many unrestricted sound effects that come with Studio, you will also find several folders of effects in the UFX, or “Ultimate FX” series. These effects are “locked” (indicated by a padlock symbol beside the sound effect name in the Album).

Using the locked sound effects

These demo effects are freely available for you to try, but a Studio 9 “watermark” will be superimposed on part of the video frame whenever the sound is playing, and an intermittent beep will be added to the soundtrack. To make use of the effects in an actual production, simply open the Album to the desired effect, then click in the *unlock* panel on the same Album page. You can purchase an *activation key* in just a few minutes, with no need to exit Studio.



The Sound Effects section of the Album, open to the “UFX House 2” theme pack of Ultimate FX sound effects. Click anywhere in the unlock panel on the right-hand page to unlock this set of effects.

For more information about purchasing premium content for Studio, see “Expanding Studio” on page 9.



THE DISC MENUS SECTION




This section of the Album contains a collection of artist-designed menus for VCD, S-VCD and DVD authoring. Menus in Studio are really specialized titles: they can be created and edited in the Title Editor, and either saved from the editor into a disk folder or incorporated directly into your movie.

As with video scenes and other visual resources, disc menus that are in use in your movie are distinguished in the Album by a green checkmark symbol.

For information on using disc menus in your movie, see *Chapter 9: Disc menus*.

The Disc Menus folder: The icons in the Disc Menus section represent files in the folder named at the top of each left-hand page in the section. Menus can be added to the section by storing them in this folder. You can also select a different folder to be the source of the section (see “Source folders for Album content” on page 30).

The *motion background* symbol: Some of the menus supplied with Studio incorporate a background of moving video rather than a static picture, and you can also create such menus yourself. This “motion background” can help give a professional look to your finished disc.

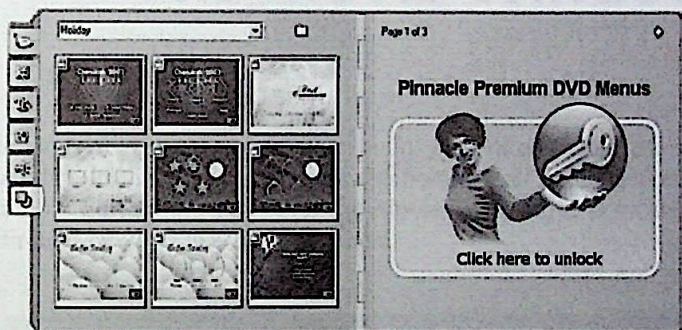
Menus with motion backgrounds are indicated by a small symbol  in the bottom right-hand corner of the Album icon.

Availability: Menus with motion backgrounds are not supported in the SE and QuickStart versions of Studio.

Along with the many standard menus and motion menus that come with Studio, you will also find several folders of menus in the “Pinnacle Premium DVD Menus” series. These menus are “locked” (indicated by a padlock symbol in the top-left corner of the menu icon.). Many of these professional DVD menus include looping soundtracks.

Using the locked menus

The demo menus are freely available for you to try, but a Studio 9 “watermark” will be superimposed on part of the video frame whenever one is playing. If you want to use one in an actual production, simply open the Album to the desired menu, then click in the *unlock* panel on the same Album page. You can purchase an *activation key* in just a few minutes, with no need to exit Studio.



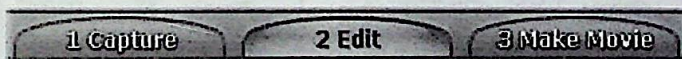
The Disc Menus section of the Album, open to the “Holiday” theme pack of Pinnacle Premium DVD Menus. Click anywhere in the unlock panel on the right-hand page to unlock this set of menus.

For more information about purchasing premium content for Studio, see “Expanding Studio” on page 9.

CHAPTER 4:

The Movie Window

The Movie Window, where you build your movie from the raw materials in the Album, occupies the bottom half of the screen in Studio's Edit mode. To access the Movie Window, first switch to Edit mode if you are not already there:



The Movie Window title bar contains several important controls and displays. The toolbox buttons at the left of the title bar open the Video toolbox and the Audio toolbox, which are discussed on page 56.

To the right of the toolbox buttons is a text area where the project file name is displayed. Status and warning messages are also displayed in this area when required. Further still to the right are the *Clip Split* and *Clip Delete* buttons, while at the far right are three *view selection* buttons (see "Movie Window views" on page 52).



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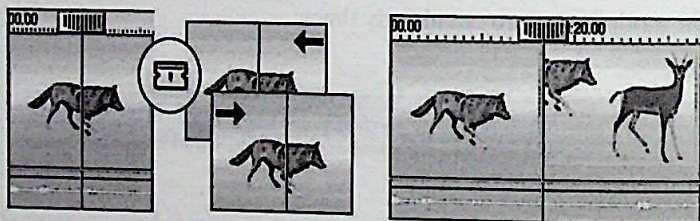
Split clip/scene button – the razorblade



Click this button to split the currently-selected clip in the Movie Window, or the currently-selected scene in the Album.

No information is lost. If the item is an Album scene, it is split at the indicated point into two shorter scenes. If the item is a clip in the Movie Window, it is duplicated and automatically trimmed to the split point.

The razorblade button can be used in conjunction with the track-locking buttons in the Movie Window's Timeline view to carry out special operations such as insert editing, and edits in which the audio leads or lags behind the video. See "Advanced Timeline editing" on page 72.



Splitting a clip: The placement of the edit line in the original clip determines the split point. When you apply the razorblade tool, Studio duplicates the clip and trims away the portion after the split point in the first copy and up to the split point in the second.

Delete Clip button – the trashcan



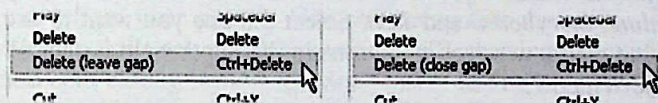
This button deletes the currently-selected content in any of the Movie Window views. By default, when video clips on the main *video* track of your project are deleted in any view, the gap in your movie that would otherwise be created by the deletion is automatically closed up, and clips on other tracks are removed or shortened as required to keep everything in sync.

If you delete clips on other tracks, the default behavior is that gaps between them are *not* automatically removed, so the timing of other clips is not affected.

If you press the Ctrl key while clicking the *delete* button, or pressing the Delete key, the default behavior for the current track is

reversed. That is, on the main video track, **Ctrl+Delete** leaves a gap when the clip is removed, while on the other tracks, the gap on the track is closed up. In neither case are other tracks affected.

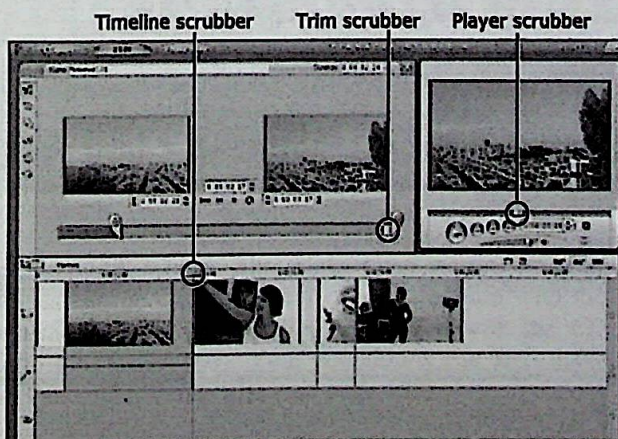
You can also access the delete operations through the right-button context menu for clips on the Timeline.



The delete options on the right-button menu for Timeline clips are not the same for clips on the main video track (L) as for those on other tracks (R). The menus summarize the context-dependent keyboard shortcuts.

Positioning: edit line, scrubbers

The *current position* is the frame showing in the Player when you are working with a clip in the Movie Window. In the Timeline view, it is indicated by the edit line. The current position can be changed by moving either the Timeline scrubber (to which the edit line is attached) or the Player scrubber.



When the Clip properties tool is open, a third scrubber, the trim scrubber, is available for adjusting the current position within the clip during trimming.

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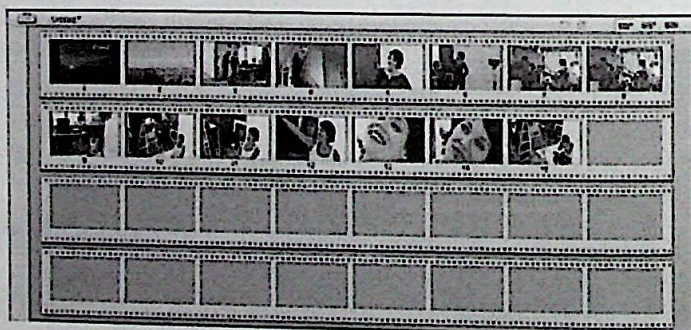
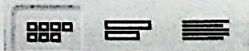


MOVIE WINDOW VIEWS

The Movie Window provides three different views of your project: *Timeline*, *Storyboard* and *Text*. Select the one you want to use by clicking the view selection buttons in the upper right corner of the Movie Window.

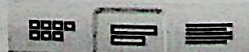
Storyboard view









Storyboard view shows the order of video scenes and transitions. It uses thumbnail icons for quickly structuring a movie. You can choose large or small thumbnails in the *Edit* options panel.

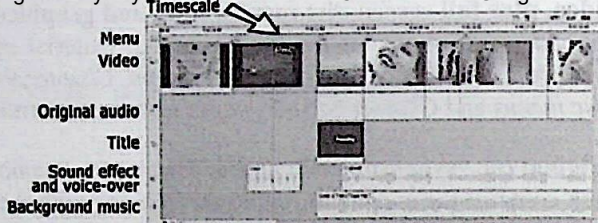


Timeline view

Timeline view shows the positions and durations of clips relative to the Timescale. This view also displays up to eight *tracks* on which you can place various types of clip:



- **Video, plus full-screen disc menus, titles and graphics:** The *video* track contains the primary visual material in your production. See *Chapter 5: Video clips*, *Chapter 9: Disc menus* and *Chapter 8: Still images* for more information. 
- **Original (or “synchronous”) audio:** The *original audio* track contains the audio that was captured along with the video from your camera. You can manipulate the audio clips on this track to achieve various effects using insert-editing and split-editing techniques. See “Insert editing” (page 73) and “Split editing” (page 75) for more information. 
- **Overlay video and audio:** In Studio Plus, video and images placed on the *overlay* track can be used with the *Picture-in-picture* and *Chroma key* tools to give your video productions a professional appearance. These features are locked in other versions of Studio, producing “watermarked” output when used. You can upgrade to Studio Plus at any time if you need its advanced capabilities. Original audio for overlay video is stored on the linked audio track. See *Chapter 6: Two-track editing with Studio Plus* for details about the *overlay* track. 

- **Title and graphic overlays:** Images placed on the *title* track will be rendered as overlays upon the main video, with transparent backgrounds. See *Chapter 8: Still images* and *Chapter 9: Disc menus* for more information. 
- **Sound effects and voice-overs:** The audio clips on this track are mixed with the *original audio* track and the *background music* track to create the final soundtrack for your movie. See *Chapter 11: Sound effects and music* for full information. 
- **Background music:** The background music for your movies can be created to any desired duration with the *SmartSound* tool (page 162) or imported with the *CD audio* tool (page 160). Your soundtrack can also make use of mp3 and other music files (see page 157). 
- **Disc menus, chapter marks and return-to-menu links:** This is an extra track that appears above the *video* track whenever the movie has at least one disc menu. See *Chapter 9: Disc menus* for information. 



Because many editing operations can be carried out only in Timeline view, you should choose it whenever extensive, detailed or advanced editing is required.

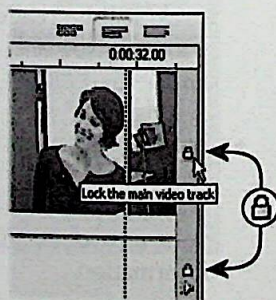
Track locking

The *video* track normally takes precedence over all other tracks for trimming or deleting. This has several consequences:

- When you trim a video clip, clips running simultaneously on other tracks are also trimmed.
- When you delete a video clip, the time segment it used is also removed from any parallel clips.
- Clips that fall entirely within a deleted video clip's span are also deleted.

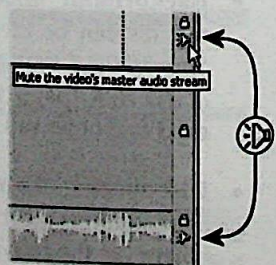
These behaviors can be bypassed when necessary with a feature that allows you to "lock" any track independently of the others, thereby excluding it from editing and playback operations.

The *padlock* buttons along the right edge of the Movie Window, can be clicked to toggle locking for the corresponding track. Track-locking gives Studio *insert-edit* and *split-edit* capability (see *Chapter 5: Video clips*).



Track muting

The audio tracks can be individually muted with the *mute* buttons at the right edge of the Movie Window. These buttons have the same function as the mute buttons in the *Volume and balance* tool. (See page 171 for more information.)

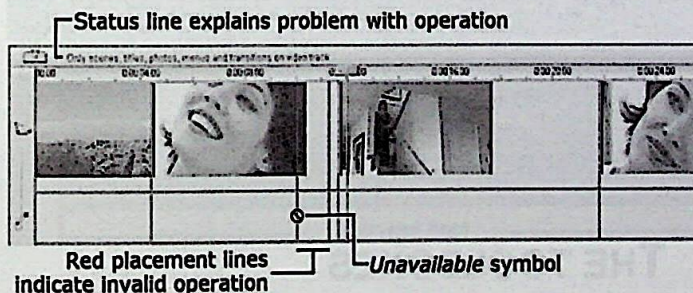


Placement feedback



Studio gives you several types of feedback about your actions as you place clips in the Timeline view.

The status line: The status line area on the left of the Movie Window title bar displays messages as you place clips and perform other actions.

Placement symbols: While you are dragging a clip into position on the Timeline, Studio provides feedback to tell you whether the current placement of the clip is valid. The mouse pointer shape and the colors of the vertical placement lines indicate what you can and cannot do.

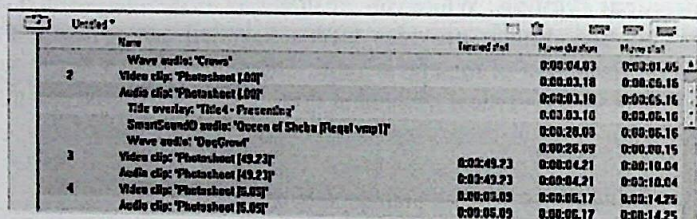


For example, if you attempt to drag a sound onto the *video* track, the placement guidelines turn from green to red, the mouse pointer changes from "copy" to "unavailable", and the status line tells you, "Only scenes, titles, photos and transitions on videotrack."

Green placement lines with the "copy" pointer  mean that an action is valid; red placement lines with the "unavailable" pointer  show that it is not.

Text view

The Movie Window Text view is a list showing the start and end times of clips, as well as their duration. In addition, custom names for clips are visible in this view.



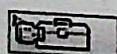
	Name	Entered at	Movie duration	Movie exit
	Wave audio: 'Crows'		0:00:04.03	0:03:01.05
2	Video clip: 'Photoshoot [00]'		0:00:01.18	0:00:06.16
	Audio clip: 'Photoshoot [00]'		0:00:01.18	0:00:06.16
	Title overlay: 'Title - Presenting'		0:00:01.10	0:00:06.16
	SmartSound0 audio: 'Queen of Sheba (Regal vmp)'		0:00:01.10	0:00:06.16
	Wave audio: 'DogGone!'		0:00:06.09	0:00:06.16
3	Video clip: 'Photoshoot [49.23]'	0:02:49.23	0:00:04.21	0:00:10.04
	Audio clip: 'Photoshoot [49.23]'	0:02:49.23	0:00:04.21	0:02:10.04
4	Video clip: 'Photoshoot [0.03]'	0:00:01.03	0:00:06.17	0:02:14.25
	Audio clip: 'Photoshoot [0.03]'	0:00:06.03	0:00:06.17	0:00:14.25



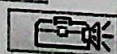
THE TOOLBOXES

The toolboxes provide a convenient point-and-click interface for editing operations – adding clips to your movie, modifying existing clips and applying special effects. Studio provides separate toolboxes for video and for audio operations.

The toolboxes are available only in Edit mode. They are opened and closed with the buttons at the top left of the Movie Window.



Video toolbox open



Audio toolbox open

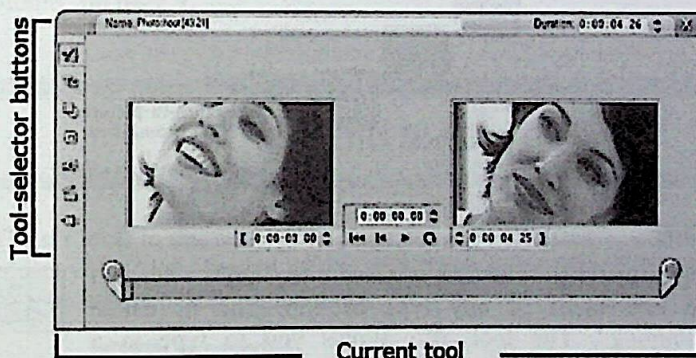


Both toolboxes closed

Select the toolbox you want to open by moving your cursor over the icons. The individual buttons highlight, indicating which

toolbox will open when you click. The Album is then replaced by the toolbox display, which contains two main areas:

- *Tool selector buttons* in a panel on the left. Clicking one of these opens the corresponding tool.
- The *currently-selected tool* on the right. Double-clicking a clip in the Movie Window also displays the corresponding tool (except for title clips, which are opened directly in the Title Editor when you double-click).



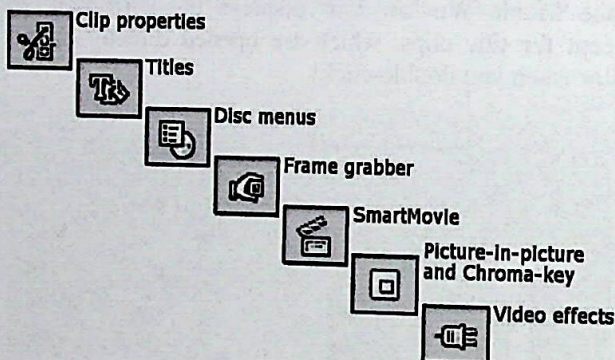
All the tool-selector buttons, except the top one in each set, open specialized tools. The top button in both toolboxes is the *Clip properties* tool. It displays a tool appropriate for trimming and otherwise editing the type of clip currently selected in the Movie Window.

The Title Editor

One powerful tool that is *not* directly accessed through the toolboxes is the Title Editor, in which you can combine text, images and other graphic resources to make titles and disc menus for your Studio productions. Access the Title Editor through the *Title* and *Disc menu* tools, or with the *Go to Title/Menu Editor* command from the right-button context menu in the Movie Window. See *Chapter 10: The Title Editor* for full information.

The Video toolbox

The six tools in this toolbox modify or create visual clip types, including video clips, titles, still images and disc menus.



Clip properties: The *Clip properties* tool adjusts the start and end times of any type of clip. This is called “trimming”. The tool also allows you to type in a descriptive name for the clip. The tool also presents additional interface components appropriate to the type of clip being edited.



Titles: This tool lets you edit the name and length of titles. The *Edit Title* button provides access to the Title Editor window where you can change the text and appearance of the title.



Disc menus: The *Disc menu* tool has a number of controls for editing the links between the buttons on a disc menu and entry points into your movie called *chapter marks*, which are represented on the *menu* track in the Movie Window. The *Edit Menu* button opens the Title Editor, where you can modify the visual appearance of a menu.



Frame grabber: This tool takes a snapshot of a single frame from your movie or from your current video source. You can use it in your movie, or save it for use in other applications. As with Capture mode itself, this tool presents a different interface if your current capture source is DV than if you are using a non-DV source.



SmartMovie: This tool automatically combines your source footage with the digital song file of your choice to create a music video in any of a variety of styles.



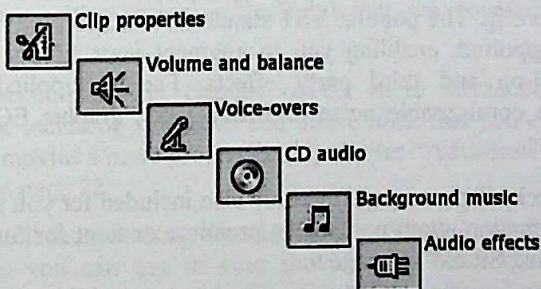
Video effects: Studio provides numerous plug-in video effects with this tool. Each video clip or still image in your project can use effects, whether alone or in combination.



Along with its basic library of useful effects, Studio provides some “locked” premium effects that you can try out. For information about purchasing premium content for Studio, see “Expanding Studio” on page 9.

The Audio toolbox

The six tools in this set operate on or create audio clips – “original” audio, voice-overs, sound effects and other audio files, CD tracks and SmartSound background music.



Clip properties: The *Clip properties* tool lets you adjust (“trim”) the start and end times of any type of clip. You can also enter a descriptive name for the clip to replace the default name if desired. (Clip names are displayed when the Movie Window is in Text view.) The tool’s other controls vary depending on the type of clip.



Volume and balance: This tool gives you master volume controls for each of the three audio tracks: *original audio* (audio captured with video), *sound effects and voice-overs* and *background music*. It also enables you to mute any or all of the tracks, and to add real-time volume fades. Use the *balance and*



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surround control to position each track independently of the other two in a one-dimensional *stereo* or two-dimensional *surround-sound* space. When the *overlay* track is open, the tool provides a fourth set of controls, which affect the *overlay audio* track.

Availability: Surround sound is not supported in the SE and QuickStart versions of Studio.

Record voice-overs: To record a voice-over, simply click the *Record* button and begin speaking into your microphone.



Add CD audio: Use this tool to add tracks, in whole or in part, from an audio CD.



Background music: This tool lets you add background music using SmartSound, Studio's powerful music generator. Choose a style, song, and version. Studio will create a musical soundtrack that matches the duration of your movie.



Audio effects: This tool lets you apply plug-in effects to any audio clip. The popular VST standard for audio plug-ins is supported, enabling you to augment your library with add-on and third party effects. Factory-supplied effects include a configurable noise reduction filter, graphic EQ, reverb and others.



Some "locked" premium effects are also included for you to try out. For information about purchasing premium content for Studio, see "Expanding Studio" on page 9.

CHAPTER 5:

Video clips

The cornerstone of most Studio video projects is the Album section containing your captured video scenes. To create your edited movie, you drag scenes from the Album into the Movie Window, where they are treated as editable *video clips*.

This chapter explains how to set the “in” and “out” (start and end) points for each clip. The Movie Window’s editing interface makes this “trimming” process simple, rapid and precise. The methods covered in this chapter for trimming video (“Trimming video clips”, page 65) can for the most part also be applied to the other types of clip (such as titles and sound effects) that are covered in later chapters.

A later section of the chapter covers more advanced editing techniques, including split edits and insert edits, that you can use to give your movies a more professional look. See “Advanced Timeline editing” on page 72.

Finally, we’ll look at using visual effects in Studio, and at some of the effects you can use in your movies - to correct a flaw, to communicate an idea, or just for fun. See “Video effects” on page 79.



VIDEO CLIP BASICS

The first step in creating a movie is to introduce some video scenes from the Album into the Movie Window, where they become editable *clips*. At some point you will probably also add some

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transitions, titles, audio and other extras, but a set of video scenes is the starting point for just about any project.

This section explains how to add scenes to your movie, and how to work with scenes from multiple capture files. It also covers some interface features that provide useful feedback as you work.

Adding video clips to your movie

There are two ways to add a video clip to your movie:

Drag and drop: Drag a scene from the Video Scenes section of the Album and drop it into the Movie Window. This is normally the easiest and quickest way to put together a rough cut of your movie. You can drag multiple scenes simultaneously if you wish.

The clipboard: The standard clipboard operations (Cut, Copy and Paste) can be used with video clips in the Movie Window. The Copy operation works on Album scenes also.

When a scene or clip is pasted into the Movie Window, it is inserted at the first clip boundary starting at the edit line position. You can use the standard keyboard shortcuts for clipboard operations (Ctrl+X for cut, Ctrl+C for copy, Ctrl+V for paste), or select the desired operation from the right-button menu.

When the Movie Window is in Timeline view, you can drop a video scene or clip onto any of the following:

- The main *video* track. If the clip has associated audio, it is added to the *original audio* track. This video will serve as the background for any overlay video or titles that on the lower Timeline tracks.
- The *overlay* track. Video on this track is superimposed on the contents of the *video* track. The picture-in-picture and chroma key effects are used to make a portion of the overlay frame transparent so that some of the main video can be seen. Except in Studio Plus, any clips on the *overlay* track are displayed with a "watermark" graphic. If you decide to use the *overlay* track in your movies, you can upgrade to Studio Plus at any time.
- The *title* track. In Studio Plus, if the *overlay* track is hidden, dropping a video clip on the *title* track cause the *overlay* track to open and the clip to be placed upon it. In other versions of Studio,

or when the *overlay* track is already displayed, the *title* does not accept video clips.

- The *sound effects* track or the *background music* track. Attempting to drop a video clip on either of these tracks actually drops the clip's original audio.

Working with multiple capture files

For some projects you may want to incorporate scenes from multiple source tapes, or from different capture files made from one tape. To achieve this, load in each of the files in turn and drag whichever scenes you want from each file into your movie.

To use multiple capture files:

1. Drag scenes from the first capture file into the Movie Window.
2. Using the dropdown list or the *folder* button in the Video Scenes section of the Album, open the second capture file. Studio displays scenes from only the current file in the Album. See "Opening a captured video file" on page 33 for detailed information on this step.
3. Drag scenes from the second captured file into the Movie Window. Continue in this manner until you have gone through all the files.

Because any given movie can be in only one of the standard 4:3 format and the widescreen 16:9 format, Studio does not let you mix frame formats in the Movie Window. The first video clip you add to a movie determines the movie's frame format, and later clips must conform to it. Use the *Aspect ratio* commands on the *Album* menu to convert scenes from one format to the other. (See "Video aspect ratios" on page 35 for more information.)

Interface features

Studio provides a variety of visual cues regarding the video clips in the Movie Window:

- Clips from video that was captured at preview quality are shown with a white dotted outline. These clips will be automatically recaptured at full quality during the Make Movie process.

- When a clip is added to the Movie Window, a green checkmark appears on the Album's icon for the corresponding scene. The checkmark remains as long as any clip in the Movie Window belongs to that scene.
- To see the original location of a clip in your source video, use the *Find Scene in Album* command on the right-click menu for Movie Window clips. Studio highlights the Album scene from which the selected clip is drawn. To go the other way, use the *Album > Find Scene in Project* to show how a particular Album scene is used in your current project.
- When neighboring scenes from the Album are placed in sequence in the Movie Window, the border between the clips is displayed as a dotted line. This is to help you keep track of your clips, and does not affect how they can be manipulated in the Movie Window.
- In Timeline mode, any special effects you have applied to a clip are indicated by small icons along the bottom of the clip. These correspond to the effect groups shown on the *Video effects* tool browser. You can open the tool for parameter editing by double-clicking any of the icons.



The star icon below this video clip shows that one or more of the effects in the "Fun effects" group has been applied.



TRIMMING VIDEO CLIPS

In general, captured video scenes contain more material than you actually require for your movie. “Trimming” – the process of adjusting the *in* and *out* points of a clip to remove unwanted footage – is a fundamental editing operation.

No data is lost by trimming: Studio sets new start and end points for the clip in the Movie Window, but the source of the clip - the original Album scene – remains intact. This means you can always reset clips to their original state, or select different trim points.

Studio offers two ways to trim any clip (video scenes, transitions, titles, still images, audio clips and disc menus):

- Directly on the Timeline (see “Trimming on the Timeline using handles” below).
- Using the *Clip properties* tool (see “Trimming with the *Clip properties* tool” on page 69).

A video clip can be trimmed to any desired *in* and *out* points within the limits of the original scene.

Trimming on the Timeline using handles

The quickest way to trim is by dragging the edges of clips directly on the Timeline. Watch the Player as you trim, so you can find the frame on which you want to begin or end.

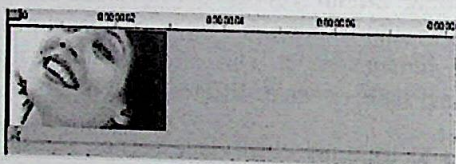
Let's first consider the simplest trimming case, in a movie with only one clip. Then we'll turn to the more usual situation of trimming a single clip that is surrounded by other clips.

To trim a single clip on the Timeline:

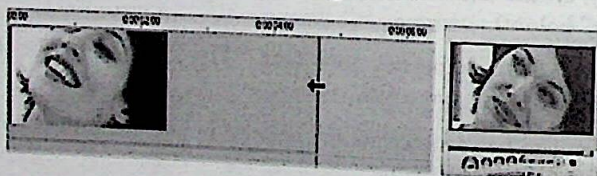
1. Delete all but one clip from the Timeline. If the Timeline is empty, drag a scene in from the Album.
2. Expand the Timescale to make fine adjustments easier.

Position the mouse pointer anywhere on the Timeline except directly over the edit line. The pointer becomes a clock symbol. Click-drag it to the right to expand the Timescale.

This illustration shows maximum expansion, where each tick mark represents a single frame:

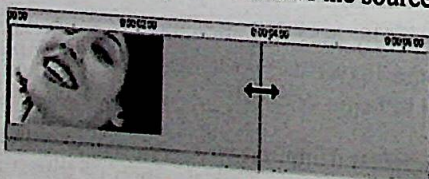


3. Position your mouse pointer over the right edge of the clip. The pointer becomes a left-pointing arrow.



4. Click-drag to the left while keeping an eye on the Player, which updates continuously to show the last frame in the trimmed clip.

As you shorten the clip, the arrow cursor becomes two-directional, indicating that the clip edge can be dragged both left and right. You can reduce the clip to as little as a single frame, or increase it up to the end of the source scene.



5. Release the mouse button. The clip is now trimmed.

Multiple clips

The secret to trimming a clip when multiple clips are on the Timeline is that you must first select the clip to be trimmed by clicking on it with the mouse.

To trim with multiple clips on the Timeline:

1. Set up the Timeline with two short clips.
2. Expand the Timescale by right-clicking in the ruler. Choose *30 seconds* from the pop-up menu.
3. Click the second clip. The *video* track should now look something like this:



You can trim the right-hand edge of the clip just as in the single-clip example above. As you do so, the last frame of the clip is displayed in the Player. As long as the second clip remains selected, you can continue to trim more video by dragging the edge to the left, or restore some of the trimmed video by dragging the edge to the right.

4. With the second clip still selected, move your mouse pointer over the left edge of clip until the pointer changes to a right arrow.



5. Drag the left edge of the second scene to the right.



As you drag, the first frame of the clip is displayed in the Player. As long as the clip remains selected, you can continue to trim more video by dragging the edge to the right, or restore some of the trimmed video by dragging the edge to the left.

6. Release the mouse button. The clip you trimmed snaps back against the right edge of the first clip.



Gaps and fills: Trimming with the Ctrl key

As we have seen in the example above, when you shorten a clip on the *video* track, the clip and any clips to the right of it move leftwards as necessary so that no gap is left. At the same time, clips on other tracks are shortened to keep the whole Timeline in sync. When you trim a clip on any *other* track, however, gaps are not automatically closed up, and no other track is affected.

This default trimming behavior simplifies editing under most circumstances, but Studio also gives you a way to invert the behavior when needed. If you press the Ctrl key before you begin trimming a clip on the *video* track, neither that clip nor any other will be repositioned, and gaps are not closed up. There is no effect on other tracks.

Meanwhile, using Ctrl when trimming clips on other tracks again inverts the normal behavior. The clips on the track will close in to fill any gap left by the trim. Clips on tracks besides the one being trimmed are again unaffected.

Note: See page 50 for a description of the parallel behavior of Ctrl when deleting clips.

Clip-trimming tips

If you are having difficulty manipulating the edges of clips during trimming, try the following:

- Verify that the clip you wish to trim is selected, and that it is the *only* one selected.
- Expand the Timescale until it is easier to make fine adjustments.
- Avoid expanding the Timescale *too* far, which makes clips appear very long. If that happens, undo until the scale is the way you want it; or reduce the scale by dragging it towards the left; or select an appropriate value from the Timescale's context menu.

Trimming with the *Clip properties* tool



Although it is possible to trim video clips directly on the Timeline with full frame accuracy, rapid, precise trimming is often easier to achieve with the *Clip properties* tool. To access this tool, select the clip you want to change, then use the *Toolbox > Modify Clip Properties* menu command, or click one of the toolbox buttons at the top left of the Movie Window. (Clicking the same button a second time will close the tool.)

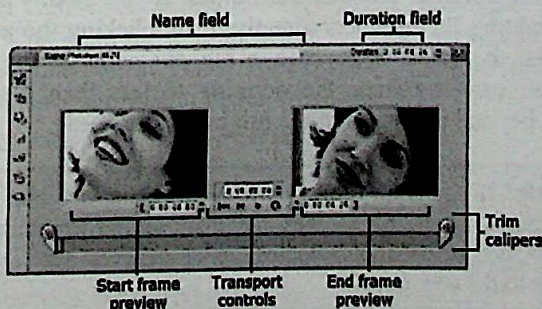
In the case of video clips – in fact, *any* clips other than titles – you can also open and close the *Clip properties* tool by double-clicking the clip in any Movie Window view.

The *Clip properties* tool can be used to modify any kind of clip. It offers an appropriate set of controls for each type.

The *Name* text field: For a video clip, most of the clip property controls are for trimming. The only exception is the *Name* text field, which lets you assign a custom name to the clip to replace the default one assigned by Studio.

The *Name* field is provided on the *Clip properties* tool for all clip types. Clip names are used by the Movie Window's Text view, and can also be viewed as fly-by labels when your mouse moves over clips in the Storyboard view.


Preview areas: Separate preview areas show the *in* and *out* frames of the trimmed clip, together with a counter and jog buttons. The layout of each preview area is similar to that of the Player during normal editing.





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Setting playback position: A scrubber control across the bottom of the tool lets you set the playback position anywhere within the clip. You can also set the playback position using the counter and jog buttons located between the two preview areas.

Using the counters: The positions reported by all three counters are relative to the beginning of the clip, which is position 0:00:00.0. As with the counter on the Player, you can adjust the counters in the *Clip properties* tool by clicking in one of the four fields (hours, minutes, seconds, frames) to select it, then using the jog buttons. When none of the fields is explicitly selected, the jog buttons apply to the frames field.

Transport controls: While the *Clip properties* tool is in use, the transport controls in the center area substitute for those that normally appear on the Player. These special transport controls include a *Loop play/Pause* button  that can be used to cycle repeatedly through the trimmed portion of the clip while the trim points are being adjusted.

Setting the trim points: The *left bracket*  button beside the counter in the left preview area, and the *right bracket*  button beside the counter in the right preview area, set their respective trim points to the current position.

You can also adjust either trim point by:

- Entering a value directly into its counter
- Adjusting a counter field with the jog buttons
- Dragging the corresponding trim caliper

The *Duration* text field: This field shows the length of the trimmed clip in hours, minutes, seconds and frames. If you modify the value, either by editing the numbers directly or by clicking the associated jog buttons, the effect is to change the *out* point of the clip. Of course, you cannot reduce the duration to less than a frame, or increase it beyond the limits of the original video scene.

Usage tip: If you want to switch from trimming one clip on the video track to trimming another, just click on the new clip while the *Clip properties* tool remains open, or drag the Timeline scrubber to the new clip.

Resetting trimmed clips

If you change your mind about a particular trim operation (or group of operations) after previewing, either use the *Undo* button (or **Ctrl+Z**) or manually reset the trimmed clip using one of these methods:

- Drag the clip's right edge directly on the Timeline until it stretches no further,
- In the *Clip properties* tool, drag the trim calipers to the ends of the clip.



SPLITTING AND COMBINING CLIPS

If you want to insert one clip on the *video* track into the middle of another clip, split the latter into two parts then insert the new item. "Splitting" a clip actually results in it being duplicated. Both clips are then automatically trimmed so that the first ends at the split point and the second begins there.

To split a clip in Timeline view:

1. Choose the split point.

You may use any method that adjusts the current position, such as moving the Timeline scrubber, clicking *Play* and then *Pause*, or editing the counter value in the Player.

2. Either right-click within the clip you wish to split and select *Split Clip* from the pop-up menu; or, make certain the edit line is positioned where you wish to split the clip, and click the *Split clip/scene* (razorblade) button (see page 50).

The clip is split at the current position.

To restore a split clip:

- Use the *Undo* button (or press **Ctrl+Z**). Even if you have performed other actions since you split the clip, the multilevel undo allows you to step back as far as needed. Or,

- If undoing is not desirable because of intervening actions that you don't want to discard, you can replace both halves of the split clip with the original from the Album. Or,
- Delete one half of the split clip, and trim out the other.

To combine clips in the Movie Window:

Select the clips you wish to combine, then right-click and choose *Combine Clips*.

The operation is allowed only if the combination of clips will also be a valid clip – that is, a continuous excerpt of the source video. On the Timeline, clips that can be combined meet along a dotted edge.



ADVANCED TIMELINE EDITING

Availability: The advanced editing techniques discussed below are not supported in the SE and QuickStart versions of Studio. The additional advanced features of Studio Plus, making use of the *overlay* track, are covered in *Chapter 6: Two-track editing with Studio Plus*.

During most editing operations, Studio automatically keeps the clips on the various Timeline tracks synchronized. For instance, when you insert a scene from the Album onto the *video* track, the relative positions of all clips to the right of the insertion remain unchanged.

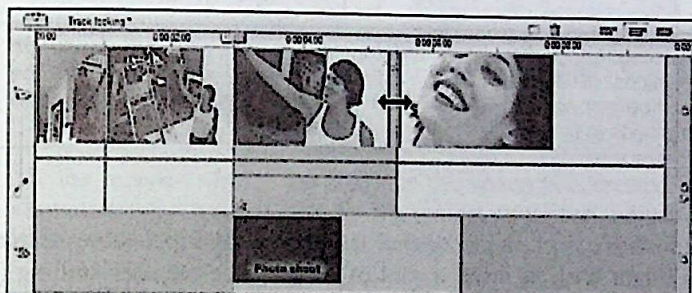
Sometimes, though, you might like to override the default synchronization. You might want to insert a new video clip into your project without displacing any clips of other types. Or you might want to edit video separately from its accompanying original audio – a valuable technique with several variations, discussed below.

Such special edits are possible using the track lock buttons along the right edge of the Movie Window in Timeline view. Each of the standard tracks (all except the *menu* track) provides a lock button. See “Track locking” on page 54 for more information on track locking.

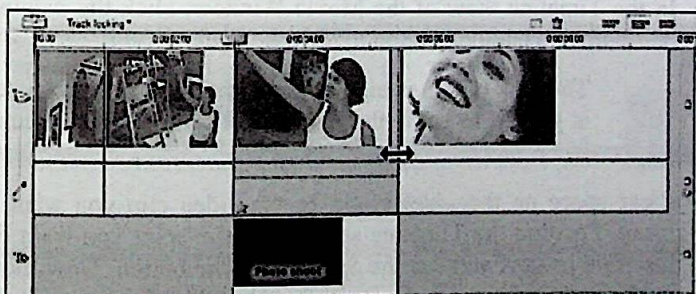
A locked track is grayed out in the Timeline view, indicating that the clips on the locked track cannot be selected or edited in any of the

three views; nor are they affected by editing operations on unlocked tracks.

Apart from the *menu* track, any combination of tracks can be locked.



Locking the *title* track, for example prevents the duration of a title from being changed even when you trim clips on the main *video* track at the same time index.



When the *title* track is unlocked, trimming the main video clip above it automatically trims the title.

Insert editing

In ordinary Timeline editing, a video clip and the original audio that was captured with it are treated as a unit. Their special relationship is symbolized in the Movie Window by the dotted line connecting the *video* track indicator with the *original audio* track indicator, showing that the latter is dependent on the former.

The track lock buttons make it possible to deal with the two tracks independently for operations like *insert editing*, which typically means replacing part of a clip on the *video* track while the *original audio* track continues uninterrupted.

Availability: Insert editing is not supported in the SE and QuickStart versions of Studio. Under Studio Plus, insert editing may also be carried out on the *overlay* video and audio tracks, using analogous methods to those described here.

For instance, in a sequence that shows someone recounting a story, you might wish to insert a shot of an audience member smiling (or sleeping!) without breaking away from the main audio.

To perform an insert edit on the *video* track:

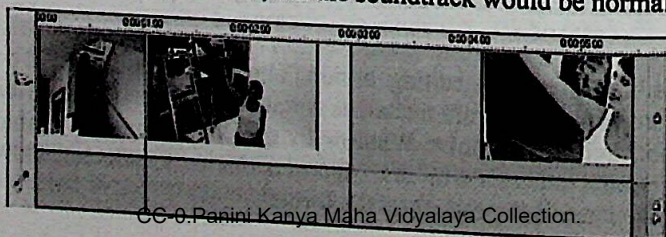
1. In the Timeline view of the Movie Window, click the *original audio* track's padlock button to lock the track.

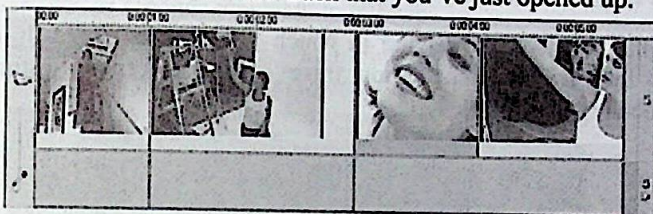


The lock button is highlighted in red, and the track itself is grayed to show that its contents will not be affected by editing operations.

2. Clear space on the *video* track for the video clip you want to insert. Position the Timeline scrubber at the point you want the insertion to start and use the *Split clip/scene* button. Now move to the point where the insertion should end and again split the clip. Finally, delete the portion of video that will be replaced by the insertion.

Because the audio track is still intact, having been locked, the video to the right of the insertion point does not move leftwards to fill the gap you have made in the Timeline, for the video and audio would then no longer be synchronized. If you were to preview your video now, you would see a black screen as the gap portion played back, but the soundtrack would be normal.





If the inserted clip is too long for the space you created it is automatically trimmed to fit the space. You can adjust the trimming with the *Clip properties* tool.

The converse insert-editing operation, in which a sound clip is inserted into the *original audio* track over unbroken video, is needed less often but is also readily performed in Studio.

The procedure is analogous to the one for inserting video: simply reverse the roles of the two tracks at every step.

Split editing

In “split editing”, a clip’s audio and video are separately trimmed so that the transition to one occurs before the transition to the other.

Availability: Split editing is not supported in the SE and QuickStart versions of Studio. Under Studio Plus, split editing may also be carried out on the *overlay* video and audio tracks, using analogous methods to those described here.

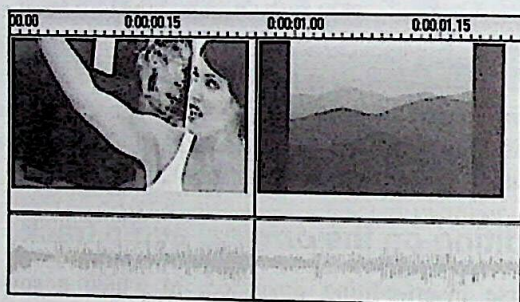
In an "L-cut", the video precedes its sync audio; in a "J-cut", the audio comes first.

Tip: For faster, more precise trimming, you may find it helpful to have the *Clip properties* tool open when following the procedures in this section. To open the tool, just double-click one of the video clips before you begin.

The L-cut

In an L-cut, the cut to new video comes before the cut in the audio.

Imagine a videotaped lecture in which the video periodically cuts away from the speaker to show travel or nature scenes illustrating the lecture topic.



Audio and video cut simultaneously.

Instead of cutting the audio and the video simultaneously, you might decide to let the speaker's voice overlap into the following scene. This makes it clear to the audience that the new scene they are now watching illustrates whatever explanation the speaker has been providing.

Notice that the video and audio clip boundaries in the completed cut form an L-shape.

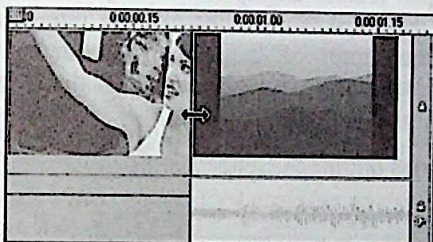


Audio cuts after video. The resulting "L" shape is outlined in this illustration.

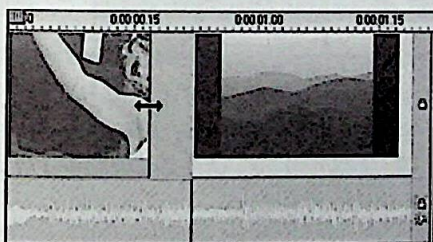
There are many effective uses of this technique. It can be considered whenever the second clip's video serves to illustrate the first clip's audio.

To perform an L-cut:

1. Adjust the Timeline so you can easily count off the number of frames or seconds you want to overlap.
2. Select the left-hand clip and trim its right edge to the point where you want the audio to end.

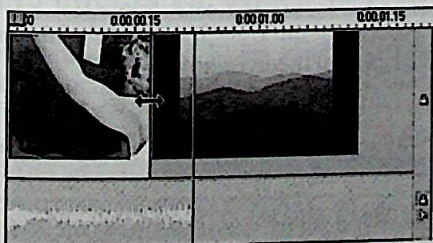


3. Lock the audio track. Now drag the right-hand edge of the same clip's video leftward to the point where the following clip's video should start.



4. With the audio track still locked, drag the second clip's video to the left until it meets the original clip.

If there isn't enough excess video at the start of the second clip to make this trim possible, you will first need to trim off a sufficient amount from both its video *and* audio then try again.



5. Unlock the audio track.

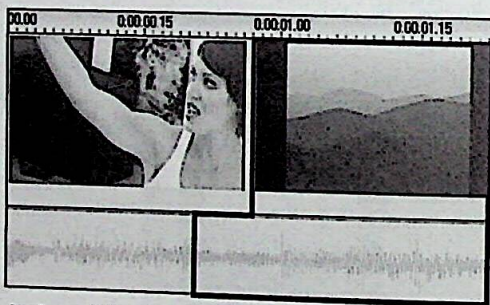
The video now cuts away to the second clip ahead of the audio. Video has been trimmed from the end of the first clip, and audio has been trimmed from the start of the second clip.

The J-cut

In the J-cut, the new audio cuts in *before* the video switches. This can be effective when the second clip's audio prepares the viewer for the material in the scene.

Returning to the videotaped lecture example, let's say we are now going to switch back to the speaker at the end of the interpolated footage. If we let the next part of the lecture appear on the soundtrack a few moments before the video shows us the podium again, the change will be much less abrupt.

This time the clip boundaries outline the letter J:



Audio cuts before video. The resulting "J" shape is outlined in this illustration.

To perform a J-cut:

1. Adjust the Timeline so you can easily count off the number of frames or seconds you want to overlap.
2. As before, trim back the right edge of the left-hand clip, both video and audio, by the overlap interval.
3. Lock the audio track. Now drag the right-hand edge of the same clip's video back to the right by the overlap interval.
4. Unlock the audio track.

The audio now cuts away to the second clip ahead of the video.

Note: The procedures described above for performing the L-cut and the J-cut are not the only possibilities. With the J-cut, for example, another method would be to trim the right-hand clip to the desired start point of the video then, with the video track locked, drag the audio portion leftwards to overlap the audio of the left-hand clip.



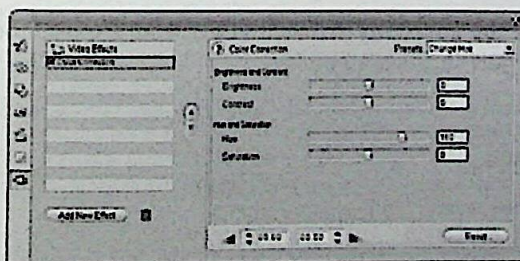
USING VIDEO EFFECTS

Most video editing consists of selecting, ordering and trimming video clips, of connecting clips with transition effects and combining them with other materials such as music and still images.

Sometimes, though, you also need to modify the video images themselves, manipulating them to achieve some desired effect. Studio's *Video effects* tool provides an extensive set of plug-in video effects that can be applied either to video or still images. See page 83 for descriptions of the basic set of effects supplied with Studio.



The *Video effects* tool is the seventh tool in the Video toolbox. It has two main areas: at the left, an *effects list* showing which effects are already attached to the currently-selected clip(s), and at the right, a *parameters panel* where you can tune the effect as required.



Video effects vs. audio effects

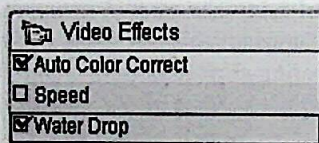
In most respects, the *Video effects* tool and the *Audio effects* tool work identically, except for the type of material they apply to.

Working with the effects list

Each video or image clip in your project can be modified by one or more video effects. Each effect is applied to the original image in turn, in the order in which they are listed on the *Video effects* tool.

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The checkboxes next to each effect name allow you to enable and disable effects individually without have to remove them from the list (which would cause any customized parameter settings to be lost). In the above illustration, the “Speed” effect has been disabled while the other two effects on the list remain in force.



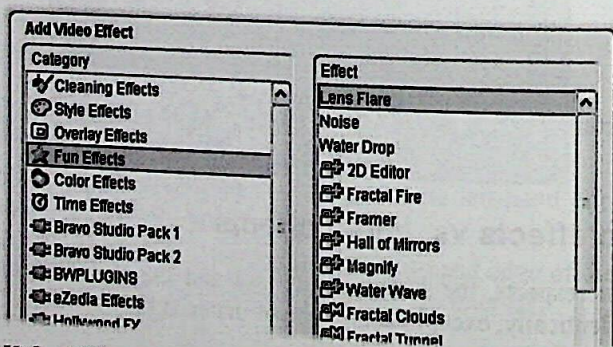
Adding and deleting effects

To add an effect to the list for the current clip, click the *Add new effect* button, which opens an *effects browser* on the right-hand side of the tool window.

Add New Effect

Click an item in the browser's *Category* list to display the names of the individual effects in that category. Select the effect you want, then click the *OK* button to add the effect.

To remove the currently-selected effect from the list, click the *delete effect* (trashcan) button.



The Video Effects browser is open here to the “Fun Effects” page. Entries having a padlock symbol are premium effects requiring separate purchase. In the illustration, variants of the padlock symbol indicate effects belonging to the Plus and Mega expansion packs, which both offer effects in several categories.

Premium video and audio effects, like other locked content in Studio, can be used freely, but cause a “watermark” graphic to be added to the video when played back. If you want to use the effect in an

actual production. You can purchase alternative content without leaving Studio. For information about purchasing locked video and audio effects, and other premium content for Studio, see “Expanding Studio” on page 9.

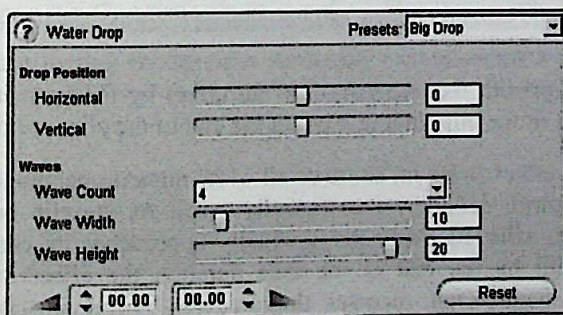
Changing the order of effects

The cumulative result of using more than one effect on the same clip can vary depending on the order in which the effects are applied. With the up and down arrow buttons to the right of the effects list, you can control the position of each effect in the processing chain. The buttons apply to the currently-selected effect.



Changing effect parameters

When an effect is selected in the effects list, the parameters panel on the right-hand side of the *Video effects* tool window provides controls for adjusting the effect’s parameters, if any.

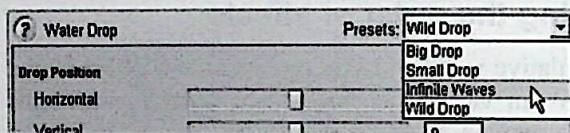


The controls for the basic library of effects supplied with Studio are described below (beginning on page 85). Add-on effects are described in their own on-line documentation, which you can access from the parameters panel by pressing function key **F1** or clicking the *help* button (?) at the top left of the parameters panel.

Note: Some plug-in effects may provide their own parameter windows with specialized controls. In those cases, the parameters panel on the effects tool displays a single *Edit* button, which accesses the external editor.

Using parameter presets

In order to simplify the use of parameters, many effects offer *presets* that let you configure an effect for a particular use simply by selecting a name from a list.



Often, the quickest way to configure an effect is to start with the preset that comes closest to what you want, then fine-tune the parameters by hand.

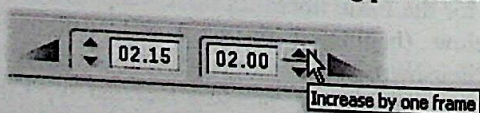
Resetting effects: A special type of preset is the factory default setting of each effect. The default can be restored at any time by clicking the *Reset* button at the bottom of the parameters panel.

Reset

Fading effects in and out

You can smooth the application of an effect by fading it in at the beginning of the clip, fading it out at the end of the clip, or both.

When an effect fades in, some or all of its numeric parameters start out at neutral, default values (usually zero). As the clip begins to play, each affected parameter gradually approaches its configured value, until by the end of the fade duration the effect is at full strength. Fading out reverses the process, by moving from the configured to the neutral values in the closing portion of the clip.



The durations for fades are set in seconds and frames using the counters at the bottom of the parameters panel for the effect. Fades can be set to any length, but the total of the fade in and the fade out must be less than or equal to the total duration of the clip.

To turn a fade off, set the corresponding fade counter to zero.

Previewing and rendering

While you are working with the *Video effects* tool, choosing effects and adjusting parameter settings, the Player gives a dynamically-updated preview of the current frame in your movie. Previewing a single frame may not be very revealing when you are working with the Time effects (page 86), or effects that evolve over the duration of the clip (like the *Water drop* effect, page 91). In those cases, you will need to play back the clip to see the full impact of the effect you are applying.



Because many effects require intensive calculation, a fully smooth and detailed preview of the full clip won't be instantaneously available in most cases. Each time effects are added or removed, or settings are changed, Studio commences "rendering" the clip – recalculating its final appearance – in the background without interrupting your workflow. The progress of rendering is indicated by a colored bar that advances from left to right along the Timescale above the clip in the Movie Window.

Options affecting background rendering are provided by the *Edit* options panel (*Setup > Edit*). See "Rendering" on page 205 for details.



VIDEO EFFECTS – THE BASIC SET

Your starter library of video effects is divided into five categories:

- **Cleaning effects** help correct defects in the source video, such as noise and camera shake.
- **Time effects** change the tempo of playback without affecting the appearance of the video frames themselves.
- **Color effects** let you modify the coloration of a clip, whether subtly or dramatically.

- **Fun effects** like *Water drop* and *Lens flare* provide extra scope for creativity and fun in your movies.
- **Style effects** like *Emboss* and *Old film* let you apply distinctive visual styles for added impact.

Availability: In the SE and QuickStart versions of Studio, the Time, Color, Fun and Style effects are rendered with a "watermark" overlying the video until unlocked by purchasing the appropriate activation key. See page 9 for details. The effects in the *Overlay* group provide the underlying functionality for the overlay features (Picture-in-picture and Chroma key) of Studio Plus. These features are covered in Chapter 11: Two-track editing with Studio Plus.

Building your effects library

Studio's plug-in architecture means that you can continue to add new effects to your video effects library as they become available. Expansion packs of effects from Pinnacle and other vendors will integrate seamlessly with the program.

Some expansion effects are shipped with Studio as locked, premium content. These include Pinnacle's Plus and Mega video effect packs, and a variety of third-party effects. Such effects can be previewed in Studio as usual, but are "watermarked" with a special graphic during playback.

Purchasing an *activation key* will remove the watermark. This can be done without leaving Studio. For more information about obtaining premium content for Studio, see "Expanding Studio" on page 9.

When context-sensitive help documentation for an add-on pack of video effects is available, it can be viewed by clicking the *help* button (?) at the top left of the parameters panel for each effect.

Warning: Studio's plug-in video effects are computer programs. They are theoretically capable of actions with the potential to damage or disrupt your system, such as modifying or deleting files and editing the system registry. Pinnacle advises against installing third-party plug-ins except those from trusted vendors.



CLEANING EFFECTS

Cleaning effects help correct defects in the source video, such as noise and camera shake.

Note: Studio's video cleaning effects are general-purpose filters designed to reduce the most common problems found on a wide range of material. They are not a panacea. Your results will vary depending on the original material and the severity and nature of the problems.

Auto color correct

This effect compensates for incorrect color balance in your video. The idea is similar to the "white balance" setting on a camcorder.

Brightness: Color correction may affect the brightness of the image. You can apply a manual correction, if needed, with this slider. (Technically, the control modifies the "contrast gamma" of the image rather than its actual brightness.)

Note: The *Auto color correct* effect may introduce video noise into the clip as a side-effect of processing. If this happens to a troublesome degree, add on the *Noise reduction* effect described below.

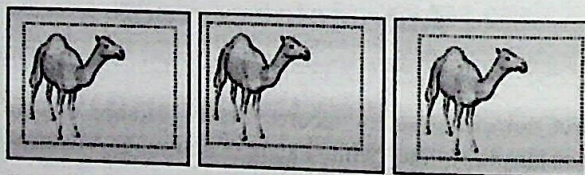
Noise reduction

This plug-in applies a noise-reduction algorithm that may improve the appearance of noisy video. In order to minimize *artifacts* (image defects caused as a side-effect of image processing), noise reduction is only performed in areas of the frame where the amount of motion falls beneath a certain threshold value.

Motion threshold: This slider governs the threshold value. Moving the slider rightwards increases the amount of motion the effect will tolerate, thus tending to increase the proportion of the image that will be affected. At the same time, the danger of introducing unacceptable artifacts into the video is also increased.

Stabilize

Like the electronic image stabilization feature in many digital camcorders, this effect minimizes jerkiness or jitter from camera movement. The edges of the image are discarded, and the center is magnified by about 20% to fill the frame. By adjusting the boundaries of the selected region on a frame-by-frame basis, Studio is able to compensate for the unwanted camera motion.



Studio's Stabilize effect works by expanding a selected area (inner lines) to full-frame size. The area is adjusted from frame to frame to compensate for slight aiming differences caused by camera shake.



TIME EFFECTS

Availability: Unrestricted use of the effects in this group is not included with the SE and QuickStart versions of Studio. Until unlocked with the appropriate activation key, a "watermark" graphic appears over part of the video frame when clips using any of the effects are played back. See page 9 for details.

Time effects change the tempo of playback without affecting the appearance of the video frames themselves.


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Speed

This effect allows you to set the speed of any video clip from one-tenth to five times normal. Set the slider to the speed you wish to apply to the clip. Notice that the clip changes length in the Movie Window as you vary its speed.



Playback speed is increased by omitting frames. Here, the movie will run at triple speed. In the first nine frames of the original clip (top), two out of every three frames will be dropped when the final movie (bottom) is generated.

Conversely, you can change the playback speed of a clip directly on the Movie Window Timeline. After selecting the clip and opening the parameters panel for the *Speed* effect, move your mouse pointer to the clip's right-hand edge. When the *Speed change* pointer  appears, click and drag the edge of the clip as though you were trimming its length. You can select anywhere from one-fifth to ten times the original duration. The actual trimming of the clip – the range of frames it incorporates – is not affected.



Playback speed is reduced by repeating frames. Here, the movie runs at one-third speed as each frame is played three times before moving onto the next.

Slowing a clip down can make its motion look choppy. The *Smooth* motion option creates intermediate frames that reduce the choppiness.



Strobe

The *Strobe* effect creates “frozen” motion like that of a dancer under strobe lights. The *Strobe repetition* parameter indicates how many times to repeat each displayed frame in the currently-selected clip. The maximum setting is 50.

The clip duration remains constant; Studio drops frames to make room for the repeated ones.

1	2	3	4	5	6	7	8	9
1	1	1	4	4	4	7	7	7

The strobe effect omits some frames and repeats others. Here, with strobing set to 2, six frames (shaded) will be dropped from the first nine frames of the clip (top). In the final movie (bottom), the remaining frames are repeated twice each.



COLOR EFFECTS

Availability: Unrestricted use of the effects in this group is not included with the SE and QuickStart versions of Studio. Until unlocked with the appropriate activation key, a “watermark” graphic appears over part of the video frame when clips using any of the effects are played back. See page 9 for details.

Color effects let you modify the coloration of a clip, whether subtly or dramatically.

Black and white

This effect subtracts some or all of the color information from the original video, with results ranging from partly desaturated (the “Faded” preset) to fully monochrome (“Black and white”). The *Amount* slider controls the strength of the effect.

Color correction

The four sliders in the parameters panel for this effect control the coloration of the current clip.

Brightness: This is the relative intensity of light, without regard to color. Try adjusting both brightness and contrast to correct video that is underexposed or overexposed.

Contrast: The range of light and dark values in a picture or the ratio between the maximum and the minimum brightness values. Moving the slider to the left lowers contrast, forcing all areas of the image towards medium brightness values. Moving the slider to the right increases contrast, making dark areas darker and bright areas brighter.

Hue: This is the visual property that allows us to distinguish colors. The slider biases all the colors in a clip towards red (right) or green (left). This can be especially useful for correcting flesh tones in some video.

Saturation: This is the quantity of pure color, ranging from zero (no color at all – a gray scale) to fully saturated (the maximum color intensity your output system can deliver). Move the slider leftwards for a tonally-reduced, washed-out look; or rightwards for extra vibrancy.

Posterize

This effect lets you control the number of colors used to render each frame of the clip, all the way from the full original palette down to two colors (black and white) as you drag the *Amount* slider from left to right. Regions of similar color are coalesced into larger flat areas as the palette shrinks.

Sepia

This effect imparts the appearance of antique photography to the clip by rendering it in sepia tones rather than full color. The strength of the effect is controlled with the *Amount* slider.



FUN EFFECTS

Availability: Unrestricted use of the effects in this group is not included with the SE and QuickStart versions of Studio. Until unlocked with the appropriate activation key, a "watermark" graphic appears over part of the video frame when clips using any of the effects are played back. See page 9 for details.

Fun effects like *Water drop* and *Noise* provide extra scope for creativity and fun in your movies.

Note: Some advanced effects in this group can only be used under Windows 2000 or Windows XP, and are not available with other Windows versions. The effects with this restriction are *Lens flare* and *Water drop*.

Lens flare

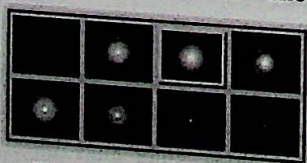
This effect simulates the flaring seen when direct bright light overexposes an area of a film or video image.

Tip: The parameters of this effect do not give good feedback during stationary preview. You can use the playback controls or the scrubbers to see the impact they have during playback.

The *Flare direction* dropdown list sets the axis of movement of the light to one of eight available orientations.

The *Size* slider sets the size of the main light.

The icons in the *Type* box let you choose from a number of models that determine the appearance and coloring of the main light. You can remove the light altogether by selecting the first option, though its secondary effects – rays and reflections – should still appear.



The eight Type options.

Noise

This effect adds a layer of simulated video noise, reminiscent of the “snow” seen in faulty television reception. The slider controls set the amount and characteristics of the noise:

- **Amount:** Set the strength of the effect.
- **Variation:** Slightly vary the random noise pattern by setting a different “seed” value for the randomizer.
- **Transparency:** Combine the original and the modified images in any desired proportion. Moving this slider rightwards moderates the overall effect.

Clear the *Color noise* checkbox if you don’t want to disturb the original coloration of the image.

Water drop

This effect simulates the impact of a drop falling onto the surface of water, producing expanding, concentric ripples.



Stages in the Water Drop effect (“Big drop” preset).

Two sliders, *Horizontal* and *Vertical*, set the drop position, and so the origin point of the waves.

The next three parameters let you set the number of ripples (1-8, or *Infinite*), plus the *Wave width* and *Wave height*. The “infinite” choice for the *Wave count* dropdown means that rippling will continue for the full duration of the clip, whereas with the numeric choices the effect ends when the last ripple has expanded beyond the edges of the video frame.

Finally, the *Refraction* slider controls the amount by which water refracts the light as it enters and leaves the wave. The resulting distortion increases as the slider moves right.



STYLE EFFECTS

Availability: Unrestricted use of the effects in this group is not included with the SE and QuickStart versions of Studio. Until unlocked with the appropriate activation key, a "watermark" graphic appears over part of the video frame when clips using any of the effects are played back. See page 9 for details.

Style effects like *Emboss* and *Old film* let you apply distinctive visual styles for added impact.

Note: The *Stained glass* effect in this group can only be used under Windows 2000 or Windows XP. It is not available with other Windows versions.

Blur

Adding *blur* to your video produces a similar result to shooting out of focus. Studio's *Blur* effect allows you to add separate intensities of horizontal and vertical blurring over the whole frame or any rectangular region within it.

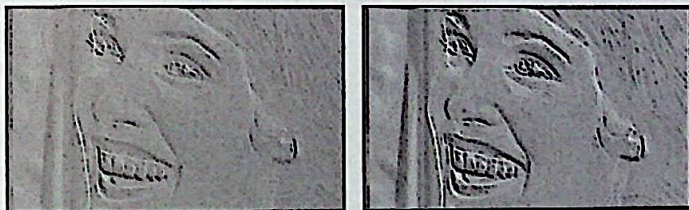
Blur Amount	
Horizontal	5
Vertical	5
Blur Region	
Left	0
Right	0
Top	0
Bottom	1

The *Horizontal* and *Vertical* sliders control the amount of blur in their respective directions from zero (no blur) to the maximum value.

The *Left*, *Right*, *Top* and *Bottom* sliders specify the margins of the blurred region as percentages of the frame width and height. Setting all the sliders to zero applies the blurring to the entire frame. You can use these sliders to blur out only a selected portion of the image, such as a person's face, an effect familiar from TV news coverage.

Emboss

This specialized effect simulates the look of an embossed or bas-relief sculpture. The strength of the effect is controlled by the *Amount* slider.



Emboss can be used with the Color Correction effect to adjust contrast and brightness (right).

Mosaic

This effect breaks each frame of the video image into increasingly large squares of solid color as you move the *Tile size* slider to the right. The color of each square is determined by averaging the colors in the corresponding area of the original.



Old film

Old movies have a number of traits that are usually considered undesirable: grainy images caused by early photographic

development processes, spots and streaks from dust and lint adhering to the film, and intermittent vertical lines where the film has been scratched during projection.



The *Old film* effect lets you simulate these defects to lend your pristine video the appearance of movies that have suffered the ravages of time.

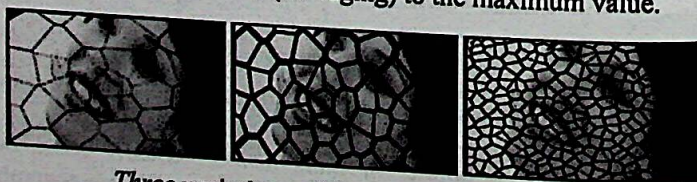
The three options on the *Color* dropdown list let you set the coloring of the video to full color, black and white, or sepia.

Stained glass

This effect simulates the appearance of viewing the video through a pane of irregular polygons arranged into a mosaic.

The *Horizontal* and *Vertical* sliders control the average dimensions of the polygonal “tiles” in the image. Move the sliders to the right to increase the tile size, or left to decrease it.

The *Joint* slider sets the width of the dark edging between neighboring tiles from zero (no edging) to the maximum value.



Three variations of the Stained Glass effect!

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THE SMARTMOVIE TOOL

Creating a music video seems like a big job, even with the convenient editing features of Studio. Dozens of brief clips must be carefully aligned to the beat of the soundtrack, in order that the music and video are properly coordinated.

With Studio's *SmartMovie* tool, however, you can construct a dynamic, beat-synchronized music video almost instantly, in your choice of styles and using any combination of video footage and music.

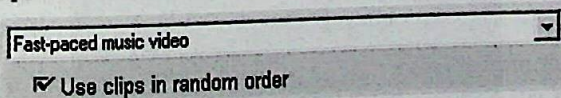


In order to create a music video, add some music to the music track

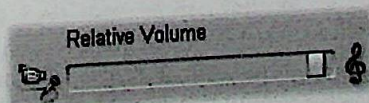
Click here to add music to your project

The tool walks you through the creation process with simple step-by-step instructions. To begin, use the Album to locate the video footage you want to include, and drag the scenes onto the Movie Window.

With the visuals in place, add a SmartSound, CD audio or digital music (wav, mp3) clip to the *background music* track. The duration of this clip determines the length of your music video. For best results, your video footage should be at least twice as long as your music clip.



Select a *style* from the dropdown list at the top of the tool window. The *Use clips in random order* option lets you mix up the video without regard to its initial sequence. This option, which is the default with some styles, will give a relatively uniform texture to the finished product, but at the expense of any narrative continuity in the original material.



The *Relative volume* slider adjusts the prominence of the *background music* track relative to the other audio tracks. Move the

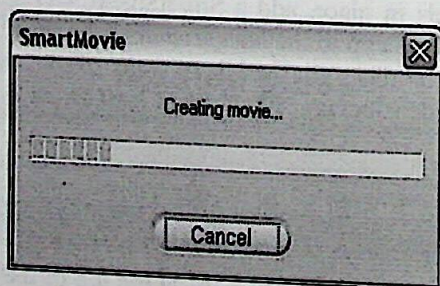
slider all the way to the right if you want to hear *only* the music track in the finished video.

Opening Title	
My Snicker-sneel	
Closing Credits	
Director	Jon Bleedingeyes
Producer	Lucinda Skindamage

The last configuration step is to enter the text to use for the opening and closing titles. Each text line consists of two edit fields. Use Tab and Shift+Tab to jump between the left and right fields.

Create SmartMovie

Finally, click the *Create SmartMovie* button and sit back while Studio generates your movie.



CHAPTER 6:

Two-track editing with Studio Plus

Studio Plus brings the power of multitrack video editing to Studio with the addition of an auxiliary video track on the Movie Window Timeline called the *overlay* track. Now you can use advanced picture-in-picture and chroma-key effects while retaining the convenience of Studio's streamlined and intuitive user interface.

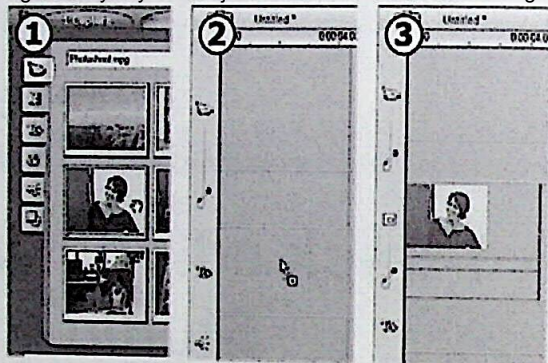
Introducing the *overlay* track

Upon installation, the Timeline displays the five tracks familiar to long-time Studio users: the *video* track with its *original audio* track, and the *title*, *sound effect* and *music* tracks.

To open the new *overlay* track, drag a video clip from the Album ❶ into the Movie Window and drop it on the *title* track ❷. The *overlay* track instantly appears with the clip properly positioned upon it ❸. (See illustration next page.)

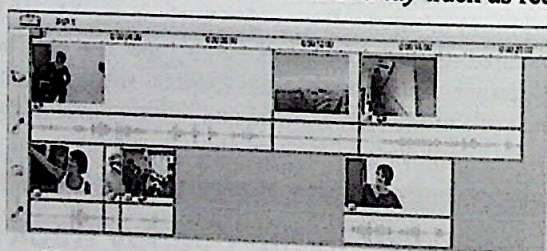
Along with the *overlay* track, Studio adds an *overlay audio* track to accommodate the video clip's original audio information.

Note: If you have used earlier versions of Studio, you may remember that the Title track, as it is now called, was formerly known as the "Title overlay track", or simply the "overlays track", reflecting that titles on this track are superimposed on the video. To simplify the terminology, we now use "overlay" only to refer to the second video track.



Drop video on the title track to open the overlay track.

Once the *overlay* video and audio tracks have been opened, Studio no longer accepts video clips on the *title* track. Drag clips from the Album directly onto either the *video* or *overlay* track as required.

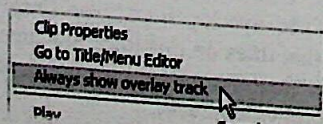


Video clips on the video and overlay tracks.

Displaying and hiding the overlay track

As we have just seen, the *overlay* video and audio tracks are displayed when you add your first overlay clip. Similarly, when you remove the last clip from these tracks, Studio again hides them from view.

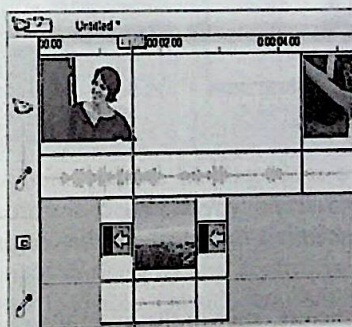
This default behavior help keep the Movie Window uncluttered, but if you are making frequent use of overlay video, you might prefer to have the track visible at all times. This can be achieved by activating the *Always show overlay track* command on the pop-up "context" menu that appears when you click on the Movie Window with your right mouse button.



A/B editing

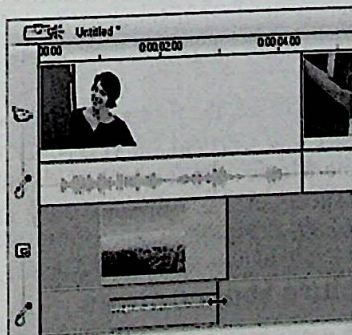
The second video track in Studio Plus often simplifies the editing tasks – insert edits, L-cuts and J-cuts – discussed under “Advanced Timeline editing” on page 72.

An *insert edit*, for instance, becomes a trivial operation: simply drag the clip to be inserted onto the *overlay* track, and trim it as desired. (See “The Picture-in-picture tool” below if you want the second video to appear at reduced size so that only part of the main video is obscured.)



An insert edit on the overlay track. The main video is obscured while the B clip is playing.

In the J-cut and the L-cut, the audio portion of a clip begins a little before (J) or a little after (L) the video. They are often used together to soften the start and end of an inserted clip.



Split editing on the overlay track. The overlay video track has been locked, allowing the B clip's audio to be trimmed. The main audio can be reduced or muted as needed.

The Picture-in-picture tool

Picture-in-picture (often abbreviated to “PIP”) – the inclusion of an additional video frame within the main video – is a versatile effect familiar from its use in professional TV productions.



Picture-in-picture with optional border, shadow and rounded corners (left). Split-screen effects, like the vertical split at right, are among the variations that show off the versatility of the PIP tool.

To use picture-in-picture, start in the usual way by dragging some video clips onto the Movie Window Timeline. Drop the clips you want for background video onto the *video* track. The foreground clip – the PIP clip – goes on the *overlay* track underneath the main clip.

Note: If you are planning a split-screen effect, like the one shown at right in the illustration above, it doesn't matter which of the two clips goes on which track.

With the clips in place, select the foreground clip and open the *Picture-in-picture and Chroma key* (PIP/CK) tool. It is the sixth tool in the Movie Window's video toolbox. We usually refer to the two aspects of the tool separately as the *Picture-in-picture* and the *Chroma key* tools.



Picture-in-picture tool controls

Most of the left-hand side of the PIP tool is taken up with an interactive *layout area* where you can both view and modify the dimensions, placement and cropping of the *overlay* video. The

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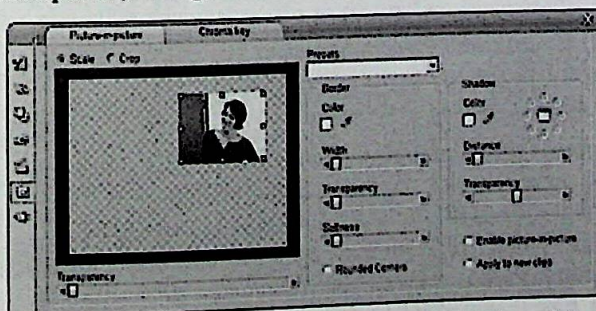
Digitized by Arva Samai Foundation Chennai and eGangotri.
adjustments that you make are reflected in the Player preview as you work.

The layout area has two modes, selected by the *Scale* and *Crop* radio buttons.

Scale mode: The gray, checked region in the layout area represents the transparent portion of the overlay frame, through which any underlying video can be seen. In typical PIP usage, this accounts for most of the screen, the overlay being sized small enough that the main video is not unnecessarily obscured. You can modify the PIP frame in three ways:

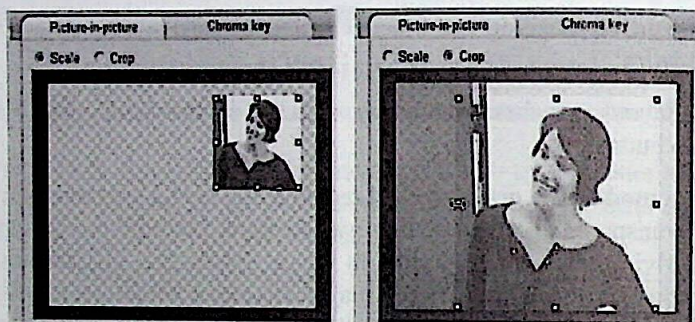
- Click on the PIP frame and drag it within the layout area to reposition it within the main video frame.
- Use the center control points on the edges of the PIP frame to change its dimensions arbitrarily.
- Use the control points at the corners of the PIP frame to change its size but not its proportions ("aspect ratio").

Crop mode: In this mode the layout area represents the entire overlay frame, regardless of its actual dimensions as set in Scale mode. The rectangle defined by the control points shows which portion of the frame is visible. Outside the visible area, the frame is semi-transparent, letting the checked pattern show through.



The Picture-in-picture and Chroma key (PIP/CK) tool is really two tools in one. Because they are used independently, we treat them as separate tools. This illustration shows the PIP side of the tool. Click the Chroma Key tab at the top of the tool to switch.

As in Scale mode, the side control points allow for free adjustment of the crop rectangle, whereas the corner control points preserve its aspect ratio.



The PIP tool in Scale (L) and Crop (R) modes.

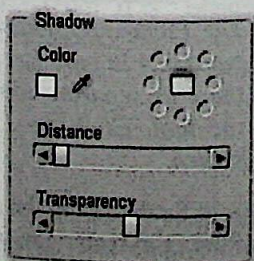
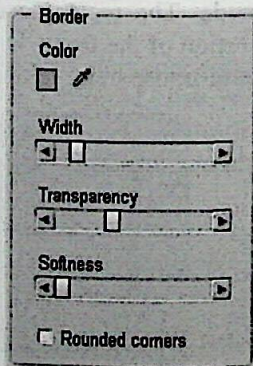
Presets: Choose a preset name to set up all the PIP controls at once to the predetermined values associated with that name. You can choose a preset as a first approximation to your desired settings, then adjust them manually until you get exactly what you want.

Transparency: Use this slider if you want the underlying video to show through the overlay itself. Moving the slider to the right makes the overlay, with its border and shadow, increasingly transparent.

Border: These controls set the color, width and transparency of the border that will be drawn around the overlay frame. Set the width to zero (slider all the way to the left) if you don't want a border at all. See page 109 for information on how to use the color controls.

The *Softness* slider controls the amount of blurring on the outside edge of the border. Move the slider left for a hard edge, or right to blend the border with the background video. Check the *Rounded corners* box if you want to round off the corners of the PIP rectangle.

Shadow: These controls set the color, width, angle and transparency of the drop shadow effect that gives the illusion of the overlay frame floating above the background video. Set the width (using the *Distance* slider) to zero if you don't want a shadow to appear.



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The dial-shaped shadow-angle control gives you eight choices for the placement of the shadow relative to the frame.

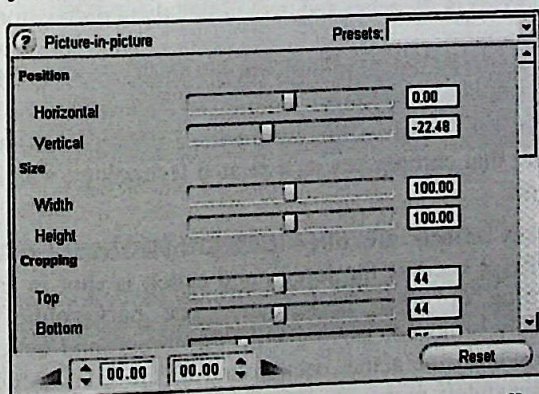
Enable picture-in-picture: This checkbox allows you to turn the PIP effect on and off.

Apply to new clips: This option is handy when you want to set up the same PIP settings for a number of different clips. As long the option is checked, PIP will automatically be applied to each new clip that you drag onto the *overlay* track, using the same settings that were displayed the last time the tool was open.

The PIP effect interface

If you prefer to enter your PIP parameter settings numerically rather than graphically, you can turn to an alternative interface provided by the *Video effects* tool. You can also combine the two methods, using the PIP tool's graphical interface to specify the initial settings, then fine tuning them with the numerical effect parameters.

The *Picture-in-picture* effect is found in the *Overlay Effects* group. The available parameter settings are almost identical to those offered by the PIP tool:



Parameter settings for the Picture-in-picture effect.

Position: The *Horizontal* and *Vertical* sliders set the offset of the center of the PIP frame from the center of the background frame.

Size: The *Width* and *Height* sliders set the size of the PIP frame as a percentage of its original dimensions. Cropping, if used, can further reduce the final size of the PIP frame on the screen.

Cropping: The four sliders in this group trim away a percentage of the original PIP video frame, allowing you to remove unnecessary portions of the image and focus on the main subject.

Video: The *Transparency* slider lets the main video show through the PIP overlay to any desired degree.

Border: The parameters in this group are equivalent to the Border settings on the PIP tool, allowing you to set the overlay border's color, thickness, transparency and edge softness, and to select the rounded corners option if desired. One bonus of the effect interface is that there are separate *Width* and *Height* controls to control the border thickness, rather than the single setting provided by the tool.

Shadow: As with the Border group, these parameters are essentially the same as those on the PIP tool, except that the *Horizontal offset* and *Vertical offset* parameters afford slightly more flexibility in positioning the shadow than the tool's *Distance* and *Angle* settings.

The Chroma key tool

Chroma key is a widely-used technique that allows foreground objects to appear in a video scene even though they were not present – and often could not have been present – when the scene was shot. When an action star tumbles into a volcano, or battles a giant cockroach, or saves the crew with a daring space-walk, the chances are that chroma key or a related technology was involved in the scene.

Chroma key effects are often called “blue-screen” or “green-screen” effects because the foreground action is shot in front of a uniform blue or green background. The background is then electronically removed, leaving only the foreground action to be superimposed on the actual background of the final scene, which has been separately prepared.

Blue and green are the generally-preferred colors for chroma key use because their removal from an image will not affect human skin tones, but in principle any hue can be used with Studio's chroma key tool.

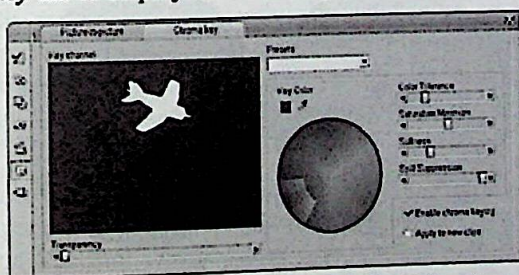
As with picture-in-picture, the first step in using chroma key is to drag some video clips onto the Timeline. Drop the clips you want

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for background video onto the **video track**. The foreground clip, which should have a uniform, highly-saturated background like the center clip in the illustration above, goes on the **overlay track** below the main clip.



Creating a scene with chroma key: A clip on the video track (L) is chosen as the background for a green-screen clip on the overlay track (C). Chroma keying removes the green to complete the scene (R).

With the clips in place, select the foreground clip and open the **Picture-in-picture and Chroma key (PIP/CK)** tool. It is the sixth tool in the Movie Window's video toolbox. Select the **Chroma key** tab to display the controls you will need.



The chroma key side of the PIP/CK tool.

Chroma-key tool controls

The chroma key tool constructs a “mask”, shown in the **Key channel** graphic on the left side of the tool, where the transparent part of the frame is drawn in black, and the opaque part – the part you will see in the final video – is drawn in white. Most of the remaining controls are used to define exactly which areas of the frame will be included in the transparent part of the mask by setting the “key color” and related properties.

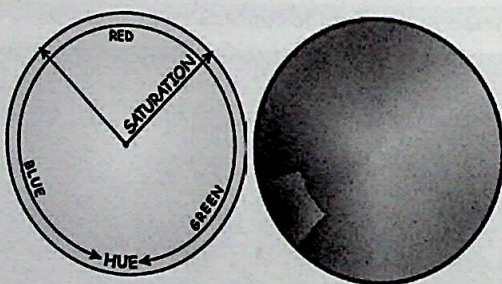
Transparency: Use this slider if you want the underlying video to show through the normally opaque overlay. Moving the slider to the right makes the overlay, with its border and shadow, increasingly transparent.

Presets: The tool provides two presets, called “Green screen key” and “Blue screen key”. These provide good starting points for setting up the tool if you are using one of the standard chroma key colors.

Key color: Use the color swatch or eye dropper buttons to select the color that will be removed from the video frame leaving only the desired foreground. See page 109 for information on how to use the color controls.

Rather than an actual color, you are really selecting only a *hue*, without regard to the other properties – *saturation* and *intensity* – that in combination with hue make a complete color specification. The chosen hue is shown by the position of the highlighted region on the circumference of the *color circle* display.

Color tolerance: This slider controls the width of the range of hues that will be recognized as belonging to the “key color”. Moving the slider to the right increases the angle of the arc covered by the highlighted region on the color circle.



The color circle on the Chroma key tool highlights a range of hues (around the circumference) and color saturation values (along the radius). Any pixel in the overlay frame whose hue and saturation fall within the highlighted region will be treated as transparent.

Saturation minimum: Saturation is the amount of hue in a color. A pixel with zero saturation (corresponding to the center of the color circle) has no hue: it falls on the “gray scale”, whose extremes are white and black. Chroma key works most effectively when the background is highly and uniformly saturated, allowing a high setting of this slider. In the real world, vagaries of lighting and apparatus often result in a background that falls short of the ideal. Moving the slider left allows a wider range of saturation values to be matched, indicated by a highlighted region that extends farther towards the center of the color circle.

Softness: This slider controls the density of the underlying video. When it is positioned all the way to the left, the main video is entirely black. As you move the slider to the right, the main video approaches full density.

Spill suppression: Adjusting this slider may help suppress video noise or fringing along the edges of the foreground object.

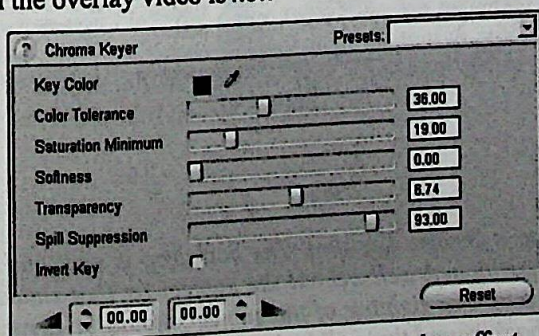
Enable chroma keying: This checkbox allows you to turn the chroma key effect on and off.

Apply to new clips: This option is handy when you want to set up the same chroma key settings for a number of different clips. As long as the option is checked, chroma key will automatically be applied to each new clip that you drag onto the *overlay* track, using the same settings that were displayed the last time the tool was open.

The chroma key effect interface

If you prefer to enter your chroma key parameter settings numerically rather than graphically, you can turn to an alternative interface provided by the *Video effects* tool. You can also combine the two methods, using the chroma key tool's graphical interface to specify the initial settings, then fine tuning them with the numerical effect parameters.

The *Chroma key* effect is found in the Overlay Effects group. The available parameter settings are almost identical to those offered by the chroma key tool, but provides one more option, *Invert Key*. When this option is activated, the normally opaque parts of the key are treated as transparent, and the transparent parts as opaque, so that the underlying video shows through only where the foreground object in the overlay video is *not*.



Parameter settings for the Chroma key effect.

Chroma key tips

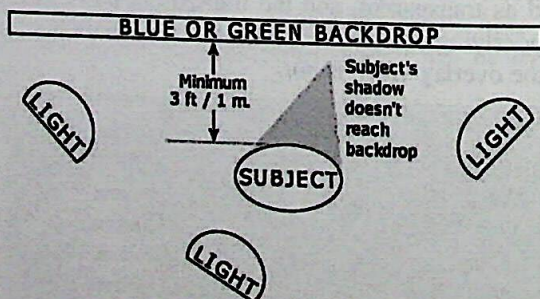
No matter how good your software may be, successful use of chroma key depends on carefully setting up your shot, and may require experimentation to get the details just right. Here are some tips to get you started:

Light the backdrop as evenly as possible: Very often, background coloring that looks flat to the naked eye will prove on playback to have areas that are too dark or too washed out to work well for chroma keying, which favors even, saturated color. Use multiple lights on the backdrop to ensure that it is well-lit across its whole area and without hotspots. Diffuse sunlight, as produced by a light overcast sky, can work well when shooting out of doors is an option.

Note: A professional background cloth for chroma key work is available as an inexpensive purchase at the Pinnacle web-site.

Don't let the subject shadow the screen: Arrange your subject and foreground lighting so that no shadows fall across the backdrop. The subject should be not less than one metre (three feet) in front of the backdrop.

Choose foreground colors carefully: Don't have your subject wear green if you are shooting on a green screen, or blue for a blue screen; those areas will be removed if they are taken to match the key color. You have to be especially careful about this when working with less even backdrops that require you to set a wider color tolerance in the chroma keyer.



Setting up a chroma key shot. The backdrop is well and evenly lit, and positioned well behind the subject so that shadows do not interfere. The lighting of the subject should be arranged to suit the background that will be keyed into the shot.

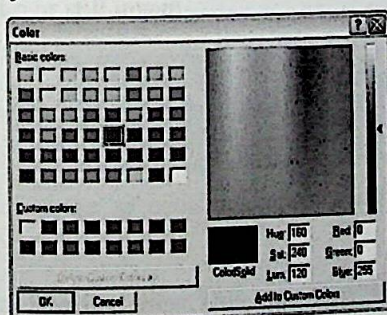
Make a smooth profile: Chroma keyers do better with a smooth edge than a jagged or complex one, so try to have your subject present a smooth profile to the camera. Hair is particularly tricky, and should be slicked down if possible. If the subject can wear a hat, so much the better.

Use tight framing: The wider your frame, the larger your background needs to be, and the more difficult it is to control your shot. One way to keep things simple is to shoot your subject from the waist up rather than in full view.

Selecting colors



To select colors in tools and effects that provide a color parameter, click either on the *color swatch* (left) or the *eye dropper* button. The first opens a standard color picker dialog; while the second lets you choose a color by clicking anywhere on the screen.



Two ways to set colors: The Windows color picker dialog (L) opens when you click the color swatch button provided in some tools and effects. Click the eye-dropper button to select a color from the Player preview window or elsewhere using a mouse pointer in the form of an eye-dropper (R).

CHAPTER 7:

Transitions

A *transition* is an animated effect that eases – or emphasizes – the passage from one clip to the next. Fades, wipes and dissolves are common types of transition. Others are more exotic, and may even involve sophisticated 3-D graphics.

Transitions are stored in their own section of the Album (see “The Transitions section” on page 41). To use a transition, drag it from the Album into the Movie Window and drop it beside any video clip or still image.



A series of transitions (the icons between the video clips) in Storyboard view.

In Timeline view, you can drop the transition on either the main *video* track, the *overlay* track, or the *title* track. On the *video* track, the transition provides a bridge between two full-screen clips (or between one clip and blackness if the transition has only one neighbor, as at the beginning of the movie). On the *overlay* and *title* tracks, the transition bridges two neighboring clips (or one clip and transparency).

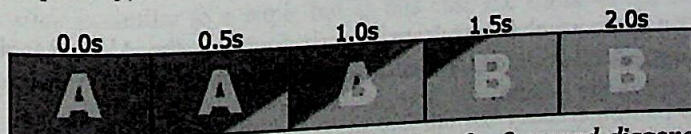


Diagram: Five snapshots from the life of a 2-second diagonal wipe transition.

If a transition is to last for two seconds (the default transition duration in a fresh Studio installation), the second clip begins to run two seconds before the first clip is finished. At the outset, only the first clip is visible; by the end, the second clip has completely replaced the first. The details of what happens in between, as the first clip is gradually removed and the second gradually appears, depend on the transition type. Since the video clips overlap, the total duration of the pair of clips is reduced by the duration of the transition.



Here is the same transition as above, this time using actual video. For clarity, the transition boundary in the three center frames has been emphasized in white. Both clips continue to run while the transition is in progress.

Transition types and their uses

Like all effects, transitions should be used not for their own sake but to serve the overall needs of your movie. Well-chosen transitions can subtly reinforce the meaning of the movie and how it plays without drawing attention to themselves. Observing the way transitions are used in professionally-produced video on television will suggest many ways to improve your own movies. Generally, it is advisable to refrain from overusing transitions that cause abrupt changes or otherwise draw attention to themselves: there's a big difference between a subtle dissolve and a heart-shaped wipe.

The basic transitions discussed below – fades, dissolves, wipes, slides and pushes – are all among the first group of transitions (the Standard Transitions) in the Album.

A set of more elaborate transitions is found in the Alpha Magic group, which is the second entry in the dropdown list of transition groups in the Album.

The many other groups on the list all belong to the Hollywood FX, a large set of complex transitions featuring three-dimensional

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graphics. The Hollywood FX transitions are discussed at the end of this section (page 114).

Cut: A cut is the minimal transition – an instantaneous shift from one scene to the next. In Studio, it is the default transition. A cut is appropriate when there is a strong inherent connection between one clip and the next; for instance, when the camera changes position or angle within a scene.

Fade: This transition fades into the beginning of a video clip from a black screen, or from the end of a clip to a black screen. A fade dropped between two clips creates a *fade down* followed by a *fade up*. The fade transition is the first transition icon in the Album.



A fade is usually used at the beginning and end of a movie, or when there is a large break in continuity, as when a new section begins. For example, a movie of a play might benefit from inserting a fade between acts.

Dissolve: A dissolve is similar to a fade, except that the new scene begins to fade up even while the old one is fading down. The visual overlap this produces is less dramatic than a fade, but less abrupt than a cut. A short dissolve can take the edge off a cut, while a long dissolve is useful to suggest the passage of time.



Wipe, slide and push: In each of these standard transition types, the incoming video is gradually revealed behind an edge that moves across the frame in a certain direction. The Album icons shown with this paragraph represent a leftward wipe, a down-and-left slide and a rightward push respectively.



In a *wipe* transition, both the old and new video occupy their normal position in the frame throughout the transition. The new video comes into view as the transition edge crosses the frame, rather like new wallpaper being rolled on over old.

A *slide* is similar to a wipe, but in this case the frame of the new video slides across the screen until it reaches its home position. The effect is reminiscent of a blind being pulled down over a window.

A *push* is similar to a slide, except that the old video is pushed out of the frame as the new video enters, like advancing a filmstrip from one frame to the next.

Hollywood FX for Studio



Pinnacle Systems' Hollywood FX includes a large number of dramatic 3-D transitions and effects. These are ideal for opening sequences, sports and action footage, or music videos. Hollywood FX satisfies professional expectations for quality without sacrificing ease of use.

A basic set of fully-functional Hollywood FX is included with Studio, along with "watermarked" demo versions of many others. Apart from the watermark (a special graphic superimposed on part of the video), the demo effects can be previewed normally within Studio. If you like the demo versions, you can purchase them in the same way as other locked content in Studio. For more information, see "Expanding Studio" on page 9.

Also available for purchase on-line is the HFX Creator editing tool for Hollywood FX. This software lets you customize your Hollywood FX, or create new ones from scratch. HFX Creator includes advanced keyframe editing for flight paths and all parameters, powerful warp plug-ins, and a 3D text generator. You can also create a wide range of 3D MultiWindow Effects using external video sources, and add real-life 3D objects and lighting.



To initiate the purchase of HFX Creator, click the *Edit* button in the *Clip properties* tool for any Hollywood FX transition.

Previewing transitions in your movie

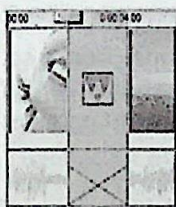
Studio lets you preview transitions in the Player. Just drag and drop a transition into the Movie Window, click the *Play* button (or hit [Space]) and see how the transition works with your material.

You can also preview transitions by scrubbing through them in the Player or on the Timeline of the Movie Window.

Background rendering of Hollywood FX

Background rendering is an optional feature in which the computation needed to create a detailed preview of Hollywood FX transitions is carried out as a "background task" with no

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interruption of your workflow. Options affecting background rendering, including the option of disabling it altogether, are provided by the *Edit* options panel (*Setup > Edit*). See “Edit settings” on page 204 for details.



Until the rendering of a transition is complete, the Player will preview it at reduced resolution and frame rate. Studio gives you feedback on the progress of background rendering with a temporary progress bar graphic in the Timescale. The bar gradually changes color as the rendering operation progresses.

3-D acceleration for Hollywood FX

Studio can use the 3-D accelerator hardware on your graphics board to speed up the computation of Hollywood FX previews. If you have 3-D acceleration, select it in the *Edit* options panel (*Setup > Edit*).

If you don't have hardware 3-D acceleration, the 3-D calculations are performed in software, which generally takes longer.

Audio transitions

Video clips in the Movie Window normally have synchronous audio. In the absence of a transition, both video and audio cut from one clip to the next. When a transition is placed between two clips, the audio cross-fades (the audio equivalent of a dissolve).

The only exception to this rule is the Fade transition, which takes the audio completely out then back in again.



Normal transitions cause a cross-fade in the audio (left). In a Fade transition (right), the audio fades down then up along with the video.

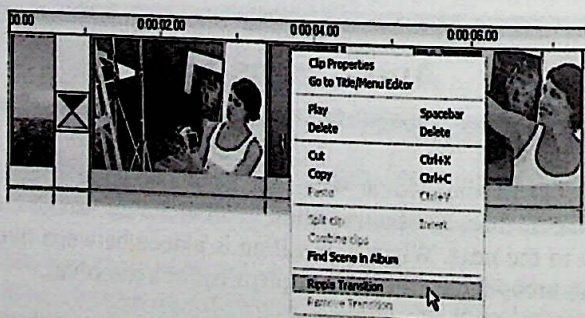
The Ripple Transition command

This Studio feature is especially useful for creating a quick slideshow from a set of still images, or a video pictorial from a set of short clips. Such a presentation is more interesting if you connect each pair of clips with a transition. *Ripple Transition* gives you a quick and easy way of achieving that.

Begin with a set of clips on the Timeline, then add a transition of the desired type between the first two clips.



Now select all the clips except the first, click on any of them with the right mouse-button, and select *Ripple Transition* from the pop-up menu.



Studio inserts a duplicate of the original transition between each pair of selected clips.





TRIMMING TRANSITIONS

Although transitions are not true clips, they are handled very similarly to clips within Studio's editing environment. Like clips, you can trim transitions either directly on the Movie Window Timeline, or by using the *Clip properties* tool.

See "Trimming on the Timeline using handles" on page 65 for a discussion of the first method. The maximum allowed duration of a transition is one frame less than the shorter of the neighboring clips.

Trimming with the *Clip properties* tool

The *Toolbox* ➤ *Modify Clip Properties* menu command invokes the *Clip properties* tool for the selected clip. For all transition types, this tool provides previewing controls, and the ability to set two properties:

- To set the duration of the transition, change the value in the *Duration* counter. A transition's duration must always be less – if only by a single frame – than the shorter of its neighboring clips.
- The *Name* text field lets you assign a custom name to the clip to replace the default one assigned by Studio. The *Name* field is provided on the *Clip properties* tool for all clip types. Clip names are used by the Movie Window's List view, and can also be viewed as fly-by labels when your mouse hovers over clips in the Storyboard view.


Many transition effects also support a "reverse direction" option, which causes the transition animation to run backwards, allowing a rotary wipe, for example, to be either clockwise or counterclockwise. The *Reverse* checkbox is enabled when the current transition supports this option.

If you have purchased the HFX Creator application, you can open it within Studio by clicking the *Edit* button on the *Clip properties* tool for Hollywood FX transitions. HFX Creator is an external editing program with many options, whose use is described in its accompanying documentation.

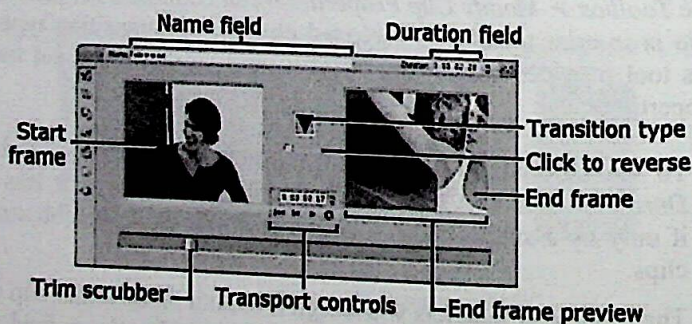
Previewing in the *Clip properties* tool

The *Clip properties* tool provides previewing controls for transitions similar to those for video clips. See “Trimming with the *Clip properties* tool” on page 69 for more information.

The preview areas show the last full frame of the outgoing clip and the first full frame of the incoming one. The preview frames update as you edit the *Duration* field.

The transport controls let you preview the transition effect in the Player either frame by frame or at full speed. The *Loop play/Pause* button  cycles through the transition repeatedly at normal playback speed.

Both the counter (with its associated jog buttons) and the scrubber give you direct access to any desired point within the transition.



CHAPTER 8:

Still images

Video usually means images in motion, but most productions also include stationary titles or graphics, and may include other types of still image as well.

The still images you can use in your movies include:

- All types of text captions and graphics, including scrolling credits and “crawled” messages.
- Photos or drawings stored in disk-based image files.
- Individual video frames obtained with the *Frame grabber* tool.
- “Disc menus” for DVD and VCD authoring. These specialized images are covered in *Chapter 9: Disc menus*.

Any of these still image types can be treated in either of two ways, depending on which track you drop them onto in the Movie Window Timeline:

- To add a *full-screen image* with a solid background, add the image to the *video* track.
- To add an image so that it appears in your movie with a *transparent background*, superimposed over the clips on the *video* track, place it on the *title* track. The color of the pixel in the top-left corner of the image will be treated as transparent when the image is placed on this track. For optimum results, you may need to prepare the image in an image-editing application beforehand.

Note: Studio Plus users have an additional option, the *overlay* track, for adding their images to the Timeline. See *Chapter 6: Two-track editing with Studio Plus*, for details.

The Album has separate sections for titles, bitmapped images and disc menus. All these resources are stored as separate files on your hard drive. You can also create titles and disc menus of your own in Studio's Title Editor and add them directly to your movie without first saving them as separate files (see *Chapter 10: The Title Editor*). Similarly, still video frames can be added directly from the *Frame grabber* tool (see "The Frame Grabber" on page 127).

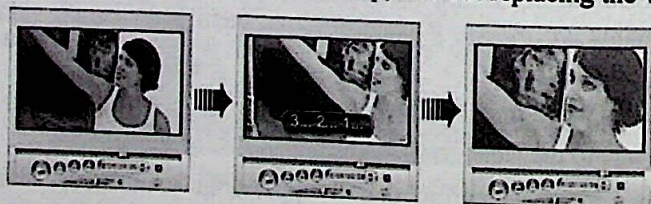
Full-screen images

A full-screen image is one that is placed on the *video* track. It fills the entire screen, replacing the video. When the preceding video clip ends, Studio plays the still image clip. The visual effect is that the video ends, and is replaced by the graphic until the next clip begins.



Overlay images

An overlay image is one that is placed on the *title* track. It is superimposed on the current video clip, without replacing the video.



Controlling transparency in overlay images

Viewed in the Album, or in a graphics editor, an overlay image appears to have a solid background. When you place it on the *title* track, however, the background disappears, allowing the video to show through.

Studio uses the color of the top-left pixel of the image to determine which areas will be transparent. Pixels that match this color are not drawn when the image is rendered over video.

This scheme works well for still images that have consistent solid background colors. Sometimes, you may have to edit the top-left pixel of a bitmapped image to get the transparency effect you want. Any image-editing program – even the Windows Paint accessory – will do the job.

The automatic transparency feature applies to images that are imported into Studio via the Title Editor as well as those that are accessed through the Album.

Making a slideshow

If you would like to assemble a quick slideshow of still images or video clips, you may want to take advantage of Studio's Ripple Transition feature to quickly insert a chosen transition between each pair of clips or images. See page 116 for details.

Applying effects

Most of Studio's plug-in video effects can be applied to still images. (The exceptions are effects like *Speed* and *Strobe* that only make sense for moving video.) See "Using video effects" on page 79 for detailed information.



EDITING STILL IMAGES

As with other types of clip, you can trim still images directly on the Movie Window Timeline, or by using the *Clip properties* tool.

See "Trimming on the Timeline using handles" on page 65 for a discussion of the first method. The difference with a still image clip is that you can extend it to any duration you choose, whereas a video clip can be no longer than the original Album scene.

Effects like *Blur*, *Posterize* and *Color correction* can be applied to still image clips of all types in the same way as to video clips. See "Video effects – the basic set" on page 83.

Editing image clip properties

The *Toolbox* ➤ *Modify Clip Properties* menu command opens a version of the *Clip properties* tool appropriate for the type of the currently-selected clip. The topmost tool icon in the video toolbox can also be used.

With *bitmapped images*, including ordinary photos and image files, and with disc menus, double-click the clip for a third way to access the tool. Double-clicking a title, however, opens it directly into the Title Editor instead.

All versions of the *Clip properties* tool allow you to set the duration and name of the current clip, as follows:

- To set the length of time the still image is displayed, change the value in the *Duration* counter.
- The *Name* text field lets you assign a custom name to the clip to replace the default one assigned by Studio. Clip names are used by the Movie Window's Text view, and can also be viewed on the fly-by labels that appear when your mouse hovers over clips in the Storyboard view.

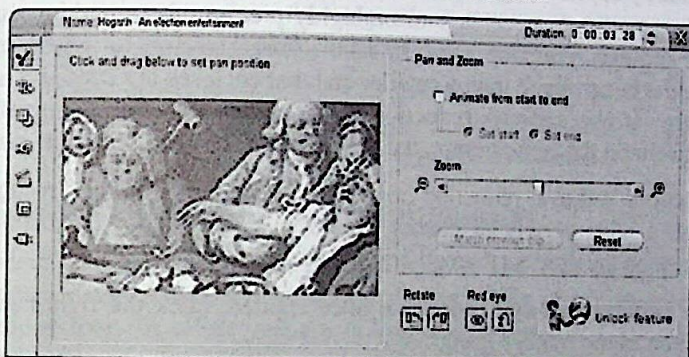
See The *Clip properties* tool for disc menus is described in *Chapter 9: Disc menus*. See *Chapter 10: The Title Editor* for details about editing the properties of titles.

Editing photos and graphics

The *Clip properties* tool for editing bitmapped images allows you to perform several important image-processing tasks:

- Zoom in on your pictures and photos in order to crop away unneeded material and focus on only the essential part of the image;
- Rotate the image in 90-degree increments to permit the use of photos taken in "portrait" mode;
- Remove the "red-eye" effect that can occur when the subject of a photograph looks directly into the camera when the flash goes off;
- In Studio Plus, put together "pan-and-zoom" animations in which a high-resolution image is viewed as a succession of smoothly-connected close-ups at various degrees of

Digitized by Anna Samai Foundation Chennai and eGangotri
magnification. This technique is closely associated with the well-known documentary filmmaker Ken Burns.



The Clip properties tool for photos has pan-and-zoom controls for focusing on an area of interest. In Studio Plus, pan-and-zoom can be animated to create the effect of traversing the image from one focus to another. In other versions of Studio, animated pan-and-zoom can be "unlocked", if required, by purchasing an activation code.

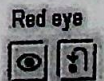
If an image needs rotating by 90 degrees to bring it into "landscape" mode (wider than high), start by clicking one of the *image rotation* buttons. If needed, click the button more than once until the clip is properly oriented.



If you want to reframe the image, click directly on the tool's preview window and, while holding the left mouse down, drag the image in any direction until it is properly positioned. Release the button to complete the operation. Next, use the *Zoom* slider to magnify or reduce the image size as desired. Adjust the position and magnification with these controls until the image is cropped and framed to your satisfaction.

The *Reset* button removes all your position and zoom changes, restoring the original framing of the image.

The *red-eye reduction* feature helps restore a natural appearance to photos in which the subject's eyes are tinged with red. (This problem is caused by light from the flash unit bouncing off the retina of the eye when the subject is looking directly into the camera.)



To activate red-eye reduction, click the left button in the *red eye* group. The button stays down when clicked. Now click the image preview with the left mouse button above and to the left of the area in which red-eye should be applied. While holding the button down, drag down and to the right until the area is fully enclosed. When

you release the mouse button, the red-eye reduction effect is instantly applied within the rectangle you have outlined.

It is usually not necessary to be highly precise when marking out the red-eye reduction area. In fact, a larger rectangle may even yield a better result than a smaller one that encloses the eyes and no more. If the red-eye reduction does not clear up the problem entirely on the first attempt, try again with a different rectangle size.

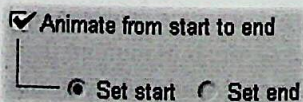
Studio's red-eye reduction algorithm provides excellent results with a wide variety of photos. However, some photos are better-suited to the process than others.

To remove red-eye reduction once applied, click the right-hand button in the *red eye* group.

Animating Pan-and-zoom in Studio Plus

If you own Studio Plus, or purchase an activation key by clicking the *unlock* button on the pan-and-zoom controls, you can create effective animations from your photos and graphic images. Use the highest-resolution images available with this technique, since they allow greater magnification levels before there is perceptible loss of quality.

Start creating a pan-and-zoom animation by clicking the *Animate from start to end* checkbox to activate the animation feature for the current clip.



This enables the *Set start* and *Set end* radio buttons, with *Set start* initially selected. Use the pan-and-zoom controls to set the framing you want to see at the start of the clip. Finally, click the *Set end* button, then use the controls to set up the framing you want for the end of the clip.

When the clip is played back, Studio will generate the intervening frames to connect your start and end views in a smooth animation.

The procedure above describes the simplest form of pan-and-zoom animation. Effective uses include:

- Moving from a full-frame photograph to a detail view of a person or thing somewhere in the image. This gives a similar result to zooming in while shooting video. This might be used to prepare the viewer for a sequence of shots exploring the same close-up subject in multiple views, or providing further close-ups of different parts of the same scene.

- Moving out from a detail to the full-frame view, as though zooming out with the video camera. In the above scenario, this returns the viewer to the original context, perhaps closing a chapter or episode within your movie.
- Panning across a wide scene to absorb its details one by one. This technique can be used to impart a sense of discovery when a dramatic or humorous detail finally comes into view.

Complex pan-and-zoom animations

When you apply pan-and-zoom to a number of copies of the same image in succession, it is as though you are taking your viewer on a guided tour. In effect you are telling a story, one that gradually unfolds as you draw attention to one detail after another.



The pan-and-zoom controls are used here to focus in turn on four vignettes in the satirical painting "An Election Entertainment" by English artist William Hogarth. A fifth view pulls back to show as much of the entire canvas as will fit in a wide-screen frame without black sidebars. The tool automatically generates smooth motion from one view to the next, panning and zooming simultaneously as needed.

Story-telling may be difficult or not, but implementing your story in Studio is very simple. Once you have set up the first clip, with

the first pan-and-zoom “camera move”, simply copy it as often as necessary, and change the *end* setting for each clip.

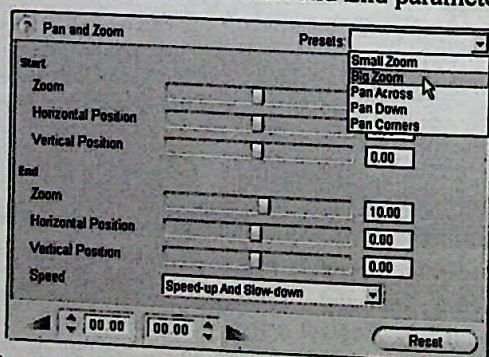
You almost always want the start framing of a new clip in the sequence to match the end framing of the previous clip, in order that the sequence of moves will be smoothly connected. On the second clip, and all those that follow, click the *Match previous clip* button wherever you want continuity.

In order to allow the movie to dwell on each detail for a while after you pan to it, insert a non-animated copy of the image between each move. Connect these static clips into the sequence as usual with the *Match previous clip* button.

The pan-and-zoom effect interface

As an alternative to setting up your pan-and-zoom animations with the *Clip properties* tool, you can enter the start and end framing properties numerically with the *Pan and zoom* video effect. This alternative interface is provided by the *Video effects* tool. You can also combine the two methods, using the tool’s graphical interface to specify the initial settings, then fine tuning them with the numerical effect parameters.

The *Pan and zoom* effect is found in the Fun Effects group. Most of the available parameter settings are exactly parallel to those offered by the *Clip properties* tool: you can set *Zoom*, *Horizontal position* and *Vertical position* in both the Start and End parameter groups.



Parameter settings for the Pan-and-zoom effect.

You have an additional option in the *Speed* dropdown, which sets a “velocity envelope” for the traversal from the start to the end positions. With “Speed-up and slow-down”, “Speed-up at start” and “Slow-down at end”, the moving frame gradually accelerates to

“cruising speed” by near the beginning of its motion, or decelerates towards the end rather than stopping abruptly, or both. The motion usually appears more natural when one of these is applied than with the remaining choice, “Constant speed”.



THE FRAME GRABBER

The Frame Grabber can capture a still image from any video capture source supported by Studio, or extract a single frame from any video clip in your current project. The grabbed frame can be added directly to your movie or saved out to disk in any of a number of standard graphics formats.

Once you have saved a grabbed frame to disk, you can:

- Use it in other software applications.
- Manipulate it in image-editing software.
- Import it back into your movies as a still image via the Album or the Title Editor.

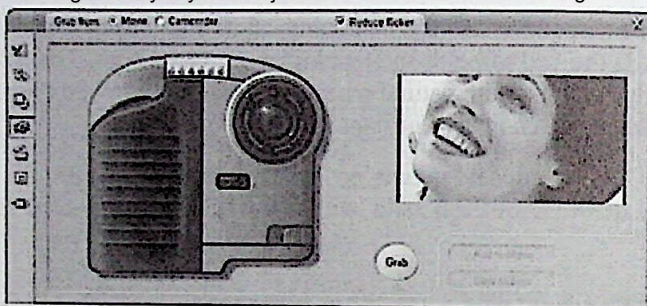
The Frame grabber tool



Use the *Frame grabber* tool in conjunction with the Player. To access it, open the Toolbox and click the *Frame grabber* button.

Play the movie or source video until the frame you want is displayed in the Player, then click the *Grab* button. The grabbed frame appears in the tool's preview area, ready to be added to your movie or saved as a file on disk.

Grab from: Select a source for the frame grabber by clicking either the *Movie* or the *Camcorder* button at the top of the tool. Choosing *Camcorder* means that the frame grabber will use your current video source, as configured in the *Capture Source* options panel (page 198) and the *Capture Format* options panel (page 201).



The Frame grabber in grab-from-movie mode. When you grab from an external source (e.g. a camcorder), the Camcorder Controller is displayed. With DV equipment, you can navigate the source tape from within the tool.

Transport controls: If your source video is a DV camcorder, MicroMV camcorder or VCR connected to a 1394 port, Studio provides convenient on-screen transport controls for locating the frame you wish to grab. For a description of these controls see “The Camcorder Controller” on page 17.

Reduce flicker: If the source video of the frame grab contains a large amount of motion, the grabbed frame may show flickering, which can be reduced or eliminated by checking the *Reduce flicker* option. Because *Reduce flicker* also reduces resolution somewhat, you should not use the option if the overall result is undesirable for a particular image.

Grab: Click the *Grab* button when you have located the frame you want to grab in the Player and configured the *Reduce flicker* option. The grabbed frame is displayed in the tool’s preview area, and the two output buttons (*Add to Movie* and *Save to Disk*) are enabled.

Add to movie: This button inserts the grabbed frame into the Movie Window *video* track ahead of the currently-selected clip.

Save to disk: This button opens a Save As dialog so that you can select a folder, file name and image format for the file in which the grabbed frame will be stored. The dialog also provides controls that let you set the resolution of the saved image to any of several standard sizes, to the original size of the grabbed frame, or to a custom size that you enter.

If the “aspect ratio” (the ratio of the width to the height) of the size you choose is different from that of the grabbed frame, the image is stretched as necessary. This can introduce visible distortion of shapes; for instance, people may appear either unnaturally thin or unnaturally squat.

CHAPTER 9:

Disc menus

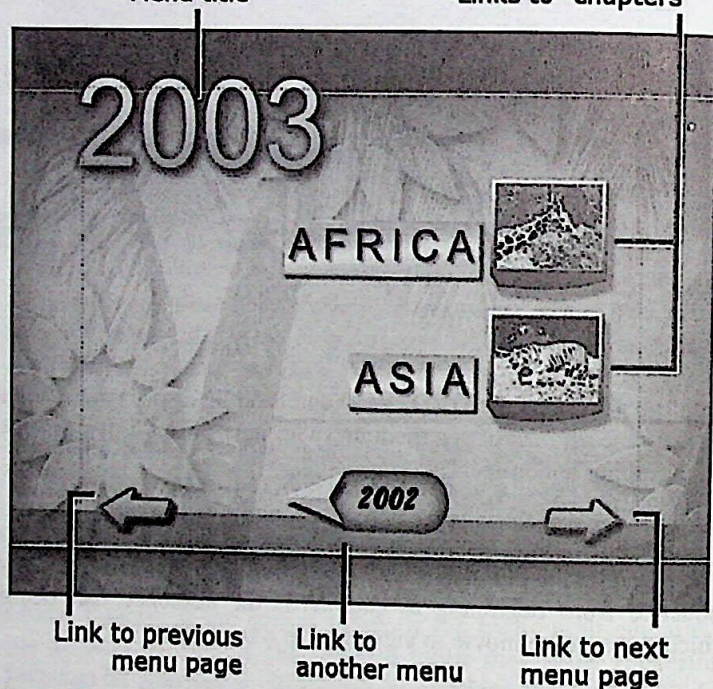
With the advent of the DVD, VCD and S-VCD disc formats, video has become an *interactive* medium, with new possibilities for both videographer and audience.

Developing – “authoring” – a disc in one of these formats means going beyond the old idea of creating a movie to be viewed in strict sequence from beginning to end. Now the audience can decide which parts of the movie to view, and in what order.

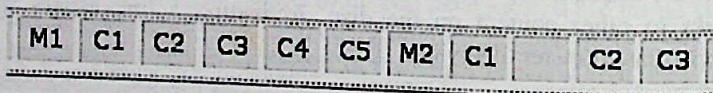
The essential new feature that makes disc authoring possible is the *menu*. A particular disc may have one, a few or many menus, each consisting of a still image or short video sequence. Areas within the menus, called *buttons*, can be selected by the viewer to activate *links* to other content on the disc. Activating a link causes an immediate transfer to any of:

- A normal video sequence, which in this context is called a “chapter”. Chapter buttons often show a thumbnail frame from the video to which they link.
- Another page of the same menu. Multiple pages are used when a menu has too many buttons to fit on a single page.
- A different menu.

Unlike any other kind of clip, menus automatically *loop*. When the end of a menu clip is reached during disc preview or playback, it is immediately restarted. This produces a jump in the playback position affecting all clips that run simultaneously with the menu, regardless of type – video (if the menu is an overlay), audio or still image.



The following diagram is patterned after the Movie Window storyboard. It shows how the menu pictured above, which appears in the diagram as *M1*, might fit into the overall scheme of a simple movie with two menus.



Each menu is followed in the movie by several chapters, all but one consisting of a single clip. Our menu, *M1*, has links to five chapters. Our menu is designed to display two chapter links per page, so three pages are required to accommodate all the links. (The second page is the one appearing in the illustration.) We've also given each page a link to the *M2* menu.

The simple layout of this short movie can easily be extended to organize large numbers of clips. Much more complex movies are also constructed from the same elements: multi-page menus with links to chapters and to other menus.

Availability: Discs with multiple menus are not supported in the SE and QuickStart versions of Studio.

Disc authoring in Studio

For the purposes of editing in Studio, a disc menu is just one more type of clip. As with titles, you can use or adapt the menus provided in the Album, or construct your own from scratch in the Title Editor (see *Chapter 3: The Album* and *Chapter 10: The Title Editor*).

To get a feeling for what is involved, try creating the pair of “instant” projects described below. You don’t have to go as far as making discs, but you can preview your movie using the DVD playback controls on the Player (see “The DVD Player Control” on page 133).

Instant video scene catalog: In an empty project, multi-select a good number of scenes from the Album and drag them onto the *video* track. Now switch to the Disc Menu section of the Album (the bottom tab) and drag any of the menus to the beginning of the Timeline. When Studio asks if you would like to “automatically create links to each scene after the menu”, click *Yes* (see “Using menus from the Album” on page 132). A new track appears at the top of the Timeline, and a small “flag” appears over each of your clips. These represent links from the menu you just added. And that’s it – sit back and watch the show.

Instant slideshow: This time, start in the Still Images section of the Album. Drag as many images as you like onto the *video* track of an empty project, then drag in any disc menu as the first clip on the Timeline, and again click *Yes* when asked if you want links automatically created. Turn next to the Transitions section of the Album, pick any transition, and drag it between the menu and the first of your still images. Finally, select *all* of the still images (click the first, then shift-click the last), click with the right mouse button, and choose *Ripple Transition* from the pop-up menu. Instant slideshow!

Menus and titles

The similarity noted on page 131 between titles and disc menus is not just on the surface: a menu is essentially “a title with buttons”. In fact, any still image type can be used as the basis for creating a menu within the Title Editor.

Like titles, menus can be used either in full-screen mode on the *video* track or as overlays on the *title* track. When a menu is used as an overlay, its background image is suppressed: only buttons, captions and graphics are displayed. This allows the menu to have a moving video background.

Using menus from the Album



The Disc Menus section of the Album contains a collection of menus that have been designed for particular occasions, authoring styles and chapter counts. Each menu provides a background picture, a title, a set of chapter buttons (generally with spaces for thumbnail frames), and a pair of *Next page* and *Previous page* buttons.

The number of chapter buttons per page varies from one menu design to another, so one criterion for selecting a menu is the number of clips you want it to handle. It is generally more convenient for the viewer to browse a few menu pages with many buttons per page than many pages of a few buttons each.

During editing, you see all the buttons that the menu provides. During playback, the only buttons visible are those to which you have assigned links.

Menus with fewer buttons have more space for captions; those with many buttons will have abbreviated captions or none at all. Whether you need captions, and if so whether they should be simple ("Chapter 1") or descriptive ("Cutting the cake") is a matter of your authoring style and the content of your movie.

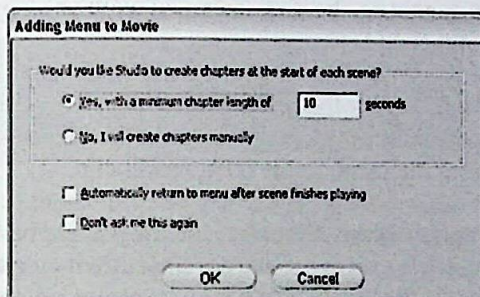
In the VCD and S-VCD formats, the viewer must select chapters numerically (by keying numbers on the remote control), so it is usual to provide button captions that include the chapter number when authoring for these formats.

Dropping menus on the Timeline

When you drag a menu from the Album and drop it onto the *video* track or the *title* track, Studio gives you the option of automatically generating links to all video clips to the right of the menu on the

CC-0. Panini Kanya Maha Vidyalaya, Coimbatore

Timeline. Multiple clips are combined into chapters if necessary to achieve the minimum chapter length you specify.



This is the quickest, easiest way to link in a disc menu, but may not be what you want in a particular authoring situation. If you check the *Don't ask me again* checkbox, your choice of *Yes* or *No* becomes the default action when you drag in a menu in future. You can also set the default action, or reinstate the confirmation window, in the *When adding a menu* area of the *Edit* options panel (see “Edit Settings” on page 204).

To create your chapter links manually, rather than using the automatic linking feature, use the *Set disc chapter* command on the pop-up context menu for each video clip you want to add, or use the *Set chapter* button on the *Clip properties* tool for disc menus.

The DVD Player Control



Studio's Player provides a specialized set of controls for previewing movies that contain menus, patterned after the button layout on a typical DVD remote control. Switch the Player to DVD mode by clicking the *DVD toggle* button at the bottom right corner of the Player.

A grouping of DVD controls appears and activates below the Player preview screen:



CC-0. Panini Kanya Maha Vidyalaya Collection.

Here are the functions of the individual DVD controls:

Main menu: Jumps to the first menu in your movie and begins (or continues) playing.



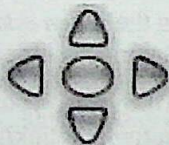
Previous menu: Jumps to the most recently active menu and begins (or continues) playing. Clicking the button again jumps back from the menu to the most recent clip.



Previous chapter, Next chapter: Clicking the *Previous chapter* button takes you to the start of the current chapter if you aren't there already. Click again to move on to the previous chapter. The *Next chapter* button takes you forward to the next chapter in the movie. Within a menu, these buttons step backwards and forwards respectively through the menu pages.



Button selection: The four arrow controls in this cluster move the on-screen cursor within a disc menu to select one of its buttons. The oval button in the middle of the cluster activates the currently-selected on-screen button, which is indicated by highlighting.



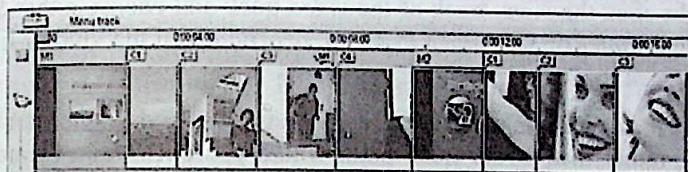
Activating menu buttons directly

One feature of the Player that set-top DVDs don't have is the ability to click the buttons directly on the screen. Whenever a button is visible in the Player preview area in DVD mode, you can click it to follow the button link.

Editing menus on the Timeline

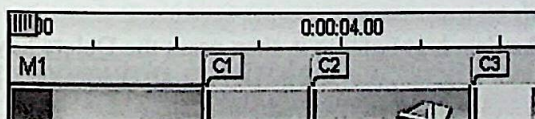
Menus can be trimmed on the Timeline just like any other still image clip (see "Trimming on the Timeline using handles" on page 65).

Setting the clip duration is generally less crucial for menu clips than for other types, since menus cycle during playback while waiting for user input. If you want a looping video background or looping audio with your menus, though, you will want to match the menu's duration to that of the clips involved.

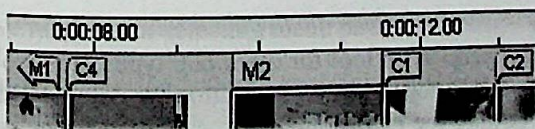


Menu buttons link to particular points within your movie. Those points are marked by flags on the *menu* track, which materializes above the *video* track the first time a menu is added to your movie (and vanishes again if all menus are removed).

The menu itself is marked by a colored rectangle in the *menu* track (*M1* and *M2* in the illustration above). Each link to a chapter is shown by a “C” flag. Here is a close-up of the first part of the Timescale, showing the rectangle identifying the first menu, and the chapter flags for three of the clips it links to.



The next part of the Timescale in the overview illustration above includes the fourth chapter link from *M1*, and a link (the left-pointing arrow) from the end of the previous clip back to the menu. A result of setting this link is that the *C4* clip can only be reached from the menu. The *C4* clip is followed by menu *M2*, which – along with the flags that belong to it – is automatically drawn in a new color.



Availability: Discs with multiple menus are not supported in the SE and QuickStart versions of Studio.

Editing on the *menu* track

Flags on the *menu* track can be moved by dragging them with the mouse, thereby changing the location at which the link takes effect in the movie. When a video clip is moved, any flags attached to the clip are moved along with it.

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To create a link:

Right-click the *menu* track or the *video* track and choose either *Set Disc Chapter* or *Set Return to Menu*, depending on the kind of link you want to create.

Return to menu links are always created at the end of the current clip, rather than at the exact point where you click. You'll rarely want to return from the middle of a clip, but you can drag the link flag to a new position if the occasion arises.

To reposition a link:

Click the flag for the link and drag it along the *menu* track to its new position.

To delete a link:

- Right-click the link flag and choose *Delete* from the pop-up menu; or,
- Select the flag, highlighting it, then press the Delete key.

Editing with the *Clip properties* tool



The *Clip properties* tool for disc menus allows you to create, edit and fine-tune chapter links, and provides access to the Title Editor for adjusting the visual content of the menu.

Like the *Clip properties* tool for other clip types, this tool lets you set a custom name for the menu by editing the *Name* field and trim the clip by editing the *Duration* field.



The *Edit menu* button at the top right of the tool opens the menu in the Title Editor. There you can change every visual aspect of the menu: its background and button images, the appearance and contents of its captions, and more. For full information about the many capabilities of the Title Editor, see *Chapter 10: The Title Editor*.

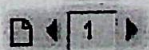
The preview area on the left side of the tool shows how the menu looks and also has interactive features you can use when establishing chapter links. (These are described on page 139 under “Chapter-editing controls”.) The other controls are in four groups:

- Menu-previewing controls
- The *Menu type* options
- Link property controls
- Chapter-editing controls

Menu-previewing controls

These controls are located below the preview area.

Page selector: For menus with multiple pages (those with more links than a single page can accommodate) the arrow buttons let you select which page is active in the preview area. You can select any page in the menu for which links have been defined.



Alternative methods of selecting menu pages:

- Step through the pages by clicking the page link buttons in the preview area.
- Use the *Button selector* control (described on page 138) to choose a button on any page of the menu.

Show link numbers checkbox: Check this box to cause link numbers to be displayed in the preview area over every button in the menu. The link numbers match the format and color of the chapter flags on the *menu* track.



The *Menu type* options

This pair of options determines whether you or Studio will organize the chapter links for this menu.

Menu type:

☒ Auto scene index ☐ Manual

If you choose *Auto scene index*, Studio will ensure that your chapter links are in the same order on the menu as they are in the movie itself, even if you shuffle the order of the clips in the Movie Window. With the *Manual* setting, the order in which chapters are shown on the menu is up to you.

Tip: If you want to sort your chapter links yet still retain future control of their order, you can click *Auto scene index* first (to sort the links), then *Manual*.

Link property controls

The controls in this area set the display properties of the chapter links on the menu.

Button selector: Every link button in your menu, no matter which page it is on, has a unique sequence number. Use the arrow buttons on this control to select the menu button you want to work on. The selected button is highlighted in the preview area. You can also select a button by clicking on it in the preview area.



Button caption text field: Edit the text for the current button without going to the Title Editor.

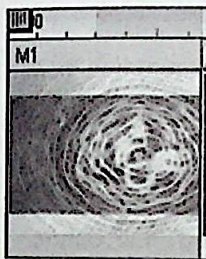
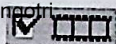
Chapter #

The “#” character in button captions has a special meaning: Studio replaces it with the button’s sequence number. Use this feature to ensure that your buttons are correctly numbered regardless of changes in the layout of the menu. To edit other characteristics of a button caption – its position, font, and styling – click the *Edit menu* button to invoke the Title Editor.

Set thumbnail button: By default, the thumbnail frame displayed on a menu button is the frame to which the button links. You can choose any frame in your movie to be the thumbnail, however. Just move the Timeline scrubber to the exact frame you want (as shown in the Player), and click the *set thumbnail* button.



Moving thumbnails checkbox: Check this option if you would like your menu's buttons to show moving video from their target chapters rather than a static thumbnail frame. Because this feature requires that the moving thumbnails be pre-



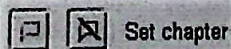
rendered, the results won't appear immediately when you preview your movie in the Player. Instead you will see a "background rendering" progress bar appear in the Timescale over the menu clip. The bar gradually changes color as the rendering operation progresses. Editing is not interrupted — Studio carries out the rendering while you work.

For more on background rendering, see "Hollywood FX for Studio" (page 114); and "Edit Settings" (page 204).


Chapter-editing controls

The controls in this area select or modify the individual chapter buttons within a menu.

The *Set chapter* buttons: These buttons set or sever the link between the currently-selected chapter button on the menu and its target clip.



Set chapter

To set a link: Position the Timeline scrubber within a menu, video or still image clip, and click the *Create chapter*  button. For video and still image clips, the chapter point is set to the exact location of the scrubber within the clip.

To clear a link: Click the *Delete chapter*  button.

***Set return* button:** This creates a "return-to-menu" link at the end of the current clip, which is where you almost always want it. During playback, the link causes an immediate jump to its menu. To create a return-to-menu link in the *Clip properties* tool, position the Timeline scrubber in the clip where you want the link, and click *Set return to menu*.



The *Return after every chapter* checkbox: Set this option to add a return-to-menu link after every chapter in this menu. Clearing the checkbox removes all the return-to-menu links for this menu, whether they were added manually or automatically.

Creating links with drag-and-drop

The *Clip properties* tool for disc menus supports drag-and-drop as a quick and convenient way to establish links for menu buttons.

To create a link using drag-and-drop:

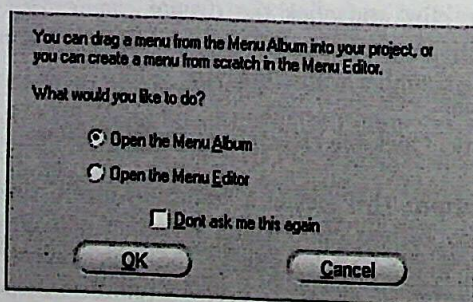
- Click the clip in the Movie Window that you want to link to, and drag it onto a button in the *Clip properties* tool preview area. The button is linked to the first frame of the clip. Or,
- Click the button for which you want to create a link, and drag it onto a clip in the Movie Window. In this case you are linking to the point within the clip at which you “drop” the button – generally *not* the first frame.

The *Disc menu* tool



If you open this tool while a menu is selected, it is equivalent to opening the *Clip properties* tool; otherwise, it provides a *Create Menu* button that takes you into the Title Editor to begin the process of creating a new disc menu.

Because developing a menu is a relatively intricate operation, Studio takes the opportunity to remind you that pre-built menus are available in the Album.



When you decide that this reminder is no longer needed, check the *Don't ask me this again* box before clicking the *OK* button.

CHAPTER 10:

The Title Editor

Studio's built-in Title Editor is a powerful facility for creating and editing titles and other graphics. Its extensive suite of text and image effects and tools provides endless possibilities for the visual design of your movie.

The Title Editor is not limited to creating passive titles. For disc projects, you can also add and edit the special buttons needed for handling viewer interaction with the menus of VCD, S-VCD and DVD movies.



Creating a title in the Studio 9 Title Editor tool. The large area containing the picture and the text is the Edit Window, while the panel occupying most of the right-hand side is the Title Editor Album. Other controls are in clusters around the Edit Window.

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Launching the Title Editor

Reflecting the versatility of the Title Editor is the variety of ways of accessing it from Studio's Edit mode, using either one of the tools in the Video toolbox (see page 58) or a mouse command on one of the Timeline tracks (see page 52).

- **To create a full-screen title or menu:** Select *Go to Title/Menu Editor* from the right-button context menu in the Timeline *video* track.
- **To create an overlay title or menu:** Double-click the Timeline *title* track.
- **To create a title or menu from the toolbox:** Open the *Create title* tool and click *Title Overlay* or *Full Screen Title*.
- **To edit a full-screen title:** Double-click the title in any Movie Window view, or right-click the title and select *Go to Title/Menu Editor*.
- **To edit a full-screen menu:** Double-click the menu in any view and click the *Edit Menu* button, or right-click the menu and select *Go to Title/Menu Editor*.
- **To edit an overlay title or menu:** Double-click the clip on the *title* track or in List View, or right-click it in any view and select *Go to Title/Menu Editor*.
- **To edit a title or menu from the toolbox:** With the clip open in the *Clip properties* tool, click the *Edit Menu* or the *Edit Title* button.

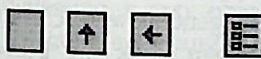
If the list seems overwhelming, don't let it concern you. In practice, getting to the Title Editor by the nearest available means will give the result you want. If you do accidentally create an overlay when you want a full-screen title or menu, or vice versa, just drag it onto the other Timeline track. If you find yourself creating a title when you wanted a disc menu, you can easily switch over in the Title Editor.



THE TITLE EDITOR CONTROLS

The main Title Editor controls are laid out in clusters around the Edit Window (see the picture on page 141).

Title-type buttons

 The four buttons in this cluster sit on the left side of the screen above the Title Editor's Edit Window. Only one of them can be selected at a time. Choose the first button if you are creating a still title. The second creates a *roll*, in which the title text and graphics travel upwards on the screen as the title displays, like the credits at the end of a movie. The third creates a *crawl*, in which the title is displayed as a single line of text moving from right to left across the screen like the bulletins on a TV news show.

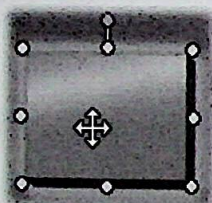
Availability: Rolls and crawls are not supported in the SE and QuickStart versions of Studio.

The fourth button is for creating *disc menus*, which you can usefully think of as "titles with buttons". In fact, a menu is just like any other title except for two attributes:

- A menu has at least one button. A title has none. Adding a button to a title turns it into a menu, and deleting the last button on a menu turns it into a title. By the same token, if you click the *Menu* button while editing a title, Studio automatically adds a button to the title.
- A menu cannot have rolling or crawling text. The Title Editor does not allow you to add menu buttons to a rolled or crawled title.

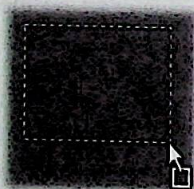
Object toolbox

↖ T ○ □ This cluster of four Title Editor tool buttons is located at left below the Edit Window.



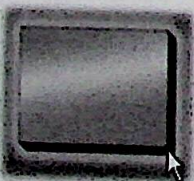
The first tool (the arrow) is used for all editing operations upon the *currently selected object*. A selected object is surrounded by a number of *control points* with which you can change its size, position, proportions, and other geometrical features.

The other three tools are for creating objects in the Edit Window – text boxes, ellipses and rectangles.



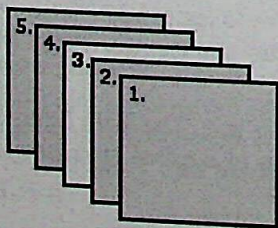
Each is used in the same general way. Click one of the three tools, then click the Edit Window at the point where one corner of the object should be. Drag the mouse to outline the new object as indicated by the dotted line.

When the object has the size and proportions you want, release the mouse. Whatever its type, the object is created with the specified dimensions. Its other attributes – color, shading, shadow, etc. – are determined by the currently selected *look* in the Title Editor Album. All attributes can later be changed at will.



After the object is created, the object tool you used deselects, and the selection arrow again becomes active. The object itself is selected – shown in the usual way by its control points – and can be manipulated with the mouse.

Reordering objects in three dimensions



Because objects can overlap one another, it is easy to get into situations where an object that should be completely visible is partly or wholly obscured by one or more other objects. In such cases, use the four reordering commands on the Title Editor's *Layers*

menu. These commands affect the currently selected object, symbolized by rectangle "3" in the diagram.

- **Bring to Front:** The object is moved out in front of all other objects. In the diagram, object 3 is now in front of object 1.
- **Send to Back:** The object moves behind all other objects. Object 3 is now behind object 5.
- **Bring Forward One Layer:** Object 3 now lies in front of objects 2, 4 and 5, but is still behind object 1.
- **Send Back One Layer:** Object 3 is now behind objects 1, 2 and 4, but is still in front of object 5.

About text objects

Selecting a text object is different in one important way from selecting a rectangle or ellipse: the object's *text field* is put into a "ready" state in which any keyboard activity will cause the field to activate and start displaying the input text.



The activation of the text field is indicated by a text insertion cursor, the changed appearance of the object frame, and the disappearance of the control points.



When a text object is *not* selected, you can activate its text field directly by clicking in the middle of the object. If you want the selection frame and control points to appear, you must click on the edges of the object. With other types of object, you can click anywhere in an object to select it.

To deactivate a text field, click anywhere in the Edit Window outside the text object.

Because text plays a central role in most titles and menus, the Text Editor will automatically create and activate a text object in the center of the Edit Window if you simply begin typing at a time when no text object already exists.

Advanced text editing features

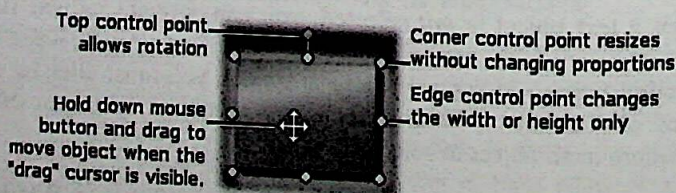
As in a word processing program, the Title Editor allows you to format a selected range of characters. Simply mark an adjacent set of characters with the mouse and apply the formatting you desire.

Supported operations on character ranges include text styling (font, style and look), clipboard operations (cut, copy, paste), delete, and a number of special positioning, spacing and scaling commands that are accessible only from the keyboard. For details on these, please consult *Appendix G: Keyboard Shortcuts*.

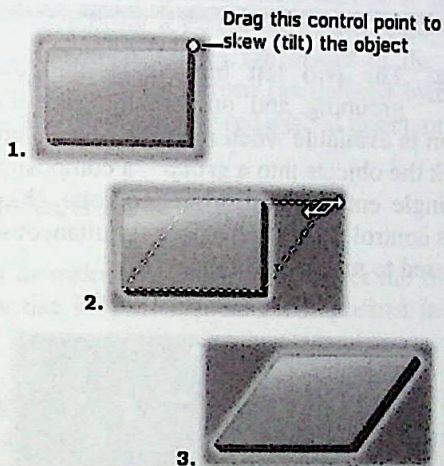
Editing-mode selection buttons

✚ ✎ These two buttons form the second cluster along the bottom of the Title Editor's Edit Window. Their function is to govern which of two sets of editing operations is available for the currently-selected object.

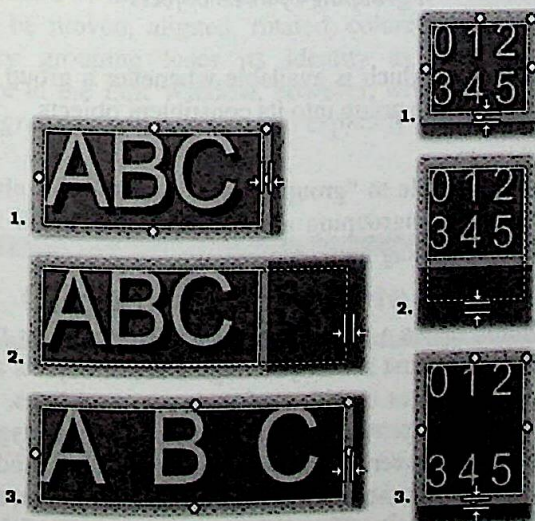
- The first button is on by default when an object is newly created. It enables the *move*, *scale* and *rotate* operations with a selection frame containing nine control points:



- Clicking the second button enables the *skew* operation, which requires only a single control point.







With text objects, the second button provides two further operations, *kern* and *change leading*, accessed by control points in the center of each edge of the text frame:



Kern (L) and Change leading (R)

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Object layout buttons





 The two left buttons in this cluster are for grouping and ungrouping Title Editor objects. The first button is available when multiple objects are selected. Its action is to link the objects into a *group* – a composite object that is treated as a single entity by editing operations. When a group is selected, all its control points are visible simultaneously, and any of them may be used to manipulate the group.

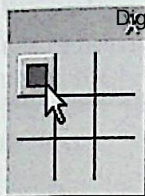


A grouping of three objects

The second button, which is available whenever a group object is selected, separates the group into its constituent objects.

Although it is possible to “group groups”, grouping is always just one level deep, so ungrouping a supergroup will result in all the constituent objects being individuals again.

The next button opens a pop-out menu of 11 operations that apply *only* to groups. The first six let you align a set of objects along any one of their four edges or either of their two mid-lines. The next pair of commands provides for spacing the objects at equal intervals in either the vertical or horizontal directions, and the final three resize the objects so that they have equal width, equal height, or both. All of these commands are particularly useful in menu creation, since you generally want menu buttons to be laid out in a regular fashion.



The final object layout button opens another pop-out menu, this one concerned with *object justification*. The nine options here are in a graphical form resembling a tic-tac-toe board. Clicking one of the nine areas moves the object to the corresponding corner of the screen (as defined by the “text-safe” area delimited by red dashed lines), or to the center.

Multiple selection of objects

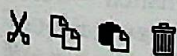
The first step in making a group is to select the multiple objects that will comprise it. This can be accomplished in either of two ways:

- By clicking and dragging with the mouse to mark out a selection rectangle (a “marquee”) that encloses all the objects you want to group; or,
- By clicking the first object you want to group, then Ctrl-clicking each of the others.

Temporary groups

Any selection of multiple objects functions as a temporary group, and can be moved, aligned, rotated, colored etc. as a unit. The temporary grouping loses its identity as soon as you click elsewhere in the Edit Window, however, whereas a group created with the *group* button persists until explicitly ungrouped.

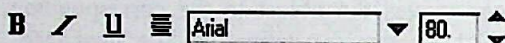
Clipboard and delete buttons



The buttons in this cluster provide the familiar editing operations *Cut*, *Copy*, *Paste* and *Delete*, all of which operate on groups, individual objects, or on selected text within a Title Editor text object. The first three work with the Windows Clipboard, while the fourth simply deletes the chosen material without affecting the Clipboard.

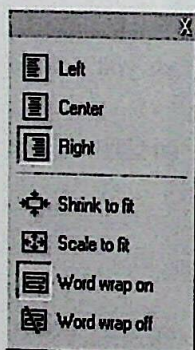
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Text-styling controls




The controls in this cluster at the top right of the Title Editor's Edit Window should look familiar to anyone who has used word-processing software. The controls apply both to currently-selected text and to any new text that may be entered until the settings are changed again.

At the left are three *font style* buttons, which select the bold, italic or underlined styles respectively.



Perhaps surprisingly, the *underlined style* button – alone among these controls – can be applied to *any* type of object, not just text (try it!). This makes it possible to use the underlined highlighting style with buttons created from graphic objects: rectangles, ellipses and pictures.

The fourth button opens a pop-out menu of *text-formatting* options. Unlike the other controls in the cluster, which govern the appearance of individual characters, the options on this menu apply to all the text in a given *text box*.

The three justification options – *Left*, *Center* and *Right* – affect the placement of the text within its box (and not the placement of the box itself within the Edit Window, which is the function of the *object justification* menu .

Shrink to fit, *Scale to fit*, *Word wrap on* and *Word wrap off* are options that determine how your text is treated when you resize a text box. With *Word wrap on*, which is the default for a new text box, resizing the box results in the text being reformatted – word-wrapped – to the new box width (while the resulting new height of the text in turn governs the height of the box). *Word wrap off* (removes all “soft” line breaks (line breaks added for word wrapping), then makes the box as wide as necessary to contain the text. *Word wrap* mode is automatically turned on again if you type further characters into the text box.

With *Scale to fit*, the text is stretched during resizing to follow both box dimensions. With *Shrink to fit*, the text remains its original size unless the box is made smaller, in which case the text is resized as in *Scale to fit*. Neither *to fit* command changes the line divisions of the text.

The font dropdown list and the font-size selector complete the text-styling controls group.



THE TITLE EDITOR ALBUM

The Title Editor Album is the rectangular panel on the right-hand side of the Title Editor screen. It contains resources for building menus and titles in the same way that the main Studio Album contains resources for creating movies.



The Title Editor Album is controlled by the four buttons shown at left, which are located between the Edit Window and the Album itself. Each button opens one of the four Album sections: the Looks Browser, the Backgrounds section, the Pictures section and the Buttons section.

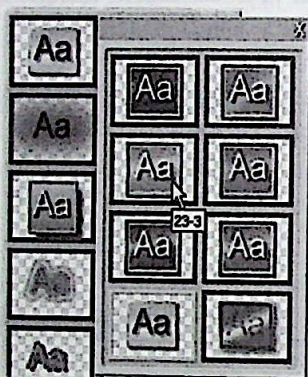
The Looks Browser

Album This section of the Title Editor Album has three subsections, accessed by the *Standard*, *Custom* and *Favorites* tabs across the top.

The *Standard* tab is a collection of styles that can be applied to the text and other objects you use in your titles. Each style consists of a color (or color gradient, or transparency) for each of the “face” (surface), edge and shadow of the object to which it applies, plus a separate blurring parameter for each. A final parameter is shadow direction, for which there are eight possibilities.

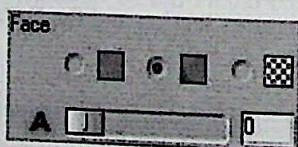
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To change the look of an existing object, simply click on the look you want while the object is selected. New objects are created with the most recently selected look.

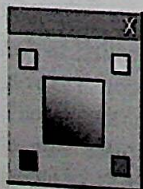


Selecting a look in the Looks Browser: Each button in the Standard tab is available in eight styles, which are presented to you as a submenu. Each look has a numeric ID that displays as a tool-tip under your mouse. Above, the mouse is on look 23-3.

The *Custom* tab lets you customize the supplied looks or create your own by adjusting the parameters listed above. Three identical sets of controls adjust the parameters for face, edge and shadow respectively. Here are the face controls:





The three option buttons across the top select a solid color, a gradient, or no color (transparency). Clicking the color swatch beside the first button invokes an otherwise standard Windows color-picker dialog to which an *Opacity* slider (0-100%) has been added.




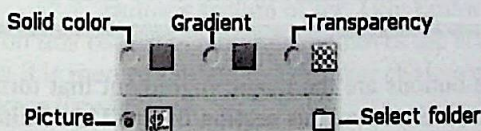
The swatch beside the second button pops up a gradient designer that lets you define a gradient by assigning the starting colors to each corner of a square surface. Click the color swatches in the corners of the gradient window to set the color for that corner in a color-picker dialog.

Digitized by Arya Samaj Foundation Chennai and eGangotri
Note: Some of the more elaborate supplied looks employ special internal features and so cannot be edited.

→   The *Favorites* tab lets you save particular custom looks that you may want to re-use in the future, to spare you from having to remember or record the parameters you used. Click the left-hand button to save the current look as one of your favorites. Click the right-hand button to delete the currently-selected “favorite”.

The Backgrounds section

 A title or menu can have four types of background: a solid color, a gradient, transparency (no background at all) or an image file (such as a drawing, photograph or saved video frame).



The *color* and *gradient* options in the Backgrounds section of the Title Editor work in just the same way as those described above for the Looks Browser (page 151), except that the color or gradient you select is instantly applied to the background of the title you are editing.

If you are working on an overlay title, you may find interesting ways to use the *Opacity* setting on the color-picker dialogs for these buttons, especially when the overlay is coupled with transitions.

Normally, though, you'll use a transparent background for titles, and *transparency* is the default background selection for a new title or menu.

The final option for backgrounds is *picture* – an image file in any standard format. As with many of the sections of Studio's main Album, the backgrounds are drawn from a source folder that may be changed using the folder button. The image file you select with the folder button becomes the new background, and the image files in the folder are displayed as thumbnails on the Album panel. If necessary, the Title Editor stretches the background image until it fills the width or height of screen but does not change its proportions.

The Pictures section



As with the background pictures just discussed, the images in the Pictures section of the Title Editor Album can be of any standard type. Instead of being stretched to fill the Edit Window, however, these pictures are added to the title as *picture objects* and displayed at normal size with eight control points that allow them to be repositioned and resized (though not rotated or skewed).

Picture objects behave just like text objects and the two types of graphic object with respect to grouping, alignment and similar controls.

The Buttons section



Since buttons are the magic ingredient that turns titles into interactive menus, this section of the Title Editor Album is mainly of interest for DVD, VCD and S-VCD authoring.

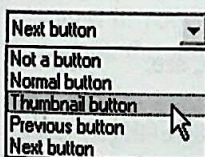
Broadly speaking, a button is an area of the screen with which the user can interact in some way. Buttons are classified according to the action they produce when the user activates them, and not by their appearance, which generally *should* be chosen to give a strong clue to their behavior, but is not required to. The four types of button are:

- **Normal:** Clicking the button causes playback to jump to a chapter (that is, ordinary video) or another menu. The link between the button and its target is created in the *Clip properties* tool, not in the Title Editor.
- **Thumbnail:** This special form of the *normal* button type displays a thumbnail frame (or a moving thumbnail preview) from the part of the movie to which it links.
- **Previous:** This button appears on the second and later pages of multi-page menus (menus with more links from *normal* or *thumbnail* buttons than will fit on one page). It links to the previous menu page.
- **Next:** This button appears on all but the last page of multi-page menus; it links to the following page.

The buttons supplied with Studio includes several examples of each type. Each button is an image file in Targa (tga) format. Examination of the files in an art program like Adobe PhotoShop or Paint Shop Pro will show that the transparent portion of the button image, and the special area for the display of thumbnails (where applicable), are defined by an alpha channel included with the image.

As usual, a *folder* button lets you select the disk directory from which the displayed images are obtained.

To use a supplied button, simply drag it from the Album into the Edit Window, where it becomes a button object – essentially an identical twin of the picture object.



The default action of the supplied buttons is determined by their file names, but a new action can be assigned to the currently-selected button object from the dropdown list in the Buttons section of the Title Editor Album. The first choice on this list, “Not a button”, removes the action from the object – now it is merely a graphic. The other choices correspond to the button types listed above.

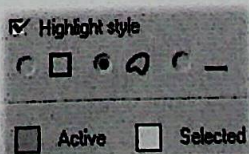
Tip: Remember, it’s not the button’s appearance that determines its behavior, but the button type you select from the menu.

In fact, you can make *any* non-group object – whether text, rectangle, ellipse, picture or button – function as a button just by selecting it in the Edit Window and choosing a new button type from the dropdown list.

Would you like to make a button that says “Grandma” and link it to the video of Grandma’s birthday party? Just create a text object, make it as fancy as you like with text stylings and the Looks Browser, and assign it the *normal* button action. Back in the *Clip properties* tool, link the new button to the chosen video clip and the job is done.

Button highlighting

DVD menus (but not VCD and S-VCD menus), give visual feedback by highlighting the current button as the user scrolls around the menu. Special active highlighting distinguishes a button that is



in the process of being actuated, just before the action is performed. (You can preview this highlighting effect in the Player, and interact with the menu using either the mouse or the Player's DVD controls.)

The Title Editor lets you assign the color that will be used for each type of highlight, and a style option that governs how the highlights will be drawn. The controls for these settings are located below the *button-type* list:

Click the *Active* and *Selected* color swatches to set the highlight colors that work best with your menu. It may help to make your menus clearer if you use consistent highlighting colors for all the menus on a disc.

The three highlight style options, from left to right, are:

- **Box:** The highlighting is drawn as a rectangle enclosing the button.
- **Follow shape:** The highlighting covers the visible area of the button, whatever its shape.
- **Underline:** The button is underlined.

These highlight options can be applied to any type of button made from any type of object, not just the button images brought in from the Album. Clear the *Highlight style* checkbox if you want to disable button highlighting while working in the Title Editor.

CHAPTER 11:

Sound effects and music

Video may be thought of as primarily a visual medium, but the role of sound in your movies is often no less important than that of the images on the screen.

Feature film and television productions include numerous types of audio, beginning with the dialog and other sounds created during live action. In your movies, that raw soundtrack is brought in along with the video during Capture mode. It appears in the Movie Window Timeline view on the *original audio* track below the *video* track. In Studio Plus, original audio may also appear on the *overlay audio* track.

Most commercial productions also require sound effects – slamming doors, crashing cars, barking dogs, etc. – and incidental music, which may consist of music created especially for the production, songs taken from recordings, or both. Voice-overs and other customized audio are also often needed.

You can use all these types of add-on sound in your own movies:

- A good starter set of effects in wav format is installed with Studio, and others are available from many sources.
- The *SmartSound* tool automatically creates a music track of any desired duration in a variety of styles.
- You can drop mp3 files from the Album onto the Timeline or import CD audio tracks with the *CD audio* tool.
- The *Voice-over* tool lets you add narration or commentary as you preview your edited video.

Audio, whatever its type, is added to your production as clips in the Movie Window. These can be moved around, trimmed and edited in much the same way as video clips and still images.

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Once a sound clip is part of your movie, you can modify it with fades and other volume adjustments. You can adjust the positioning of your clips within a stereo or surround mix, and even change that positioning arbitrarily within the clip. You can also apply Studio's audio effects, including noise reduction and reverb among others.

Availability: Surround sound is not supported in the SE and QuickStart versions of Studio.

About surround sound

A "surround" mix goes beyond standard two-channel to provide a theater-style enveloping sound field for your DVD productions. Studio lets you set the apparent position of each audio track independently within the mix, and to "pan" the track (reposition it, whether smoothly or abruptly) in any desired direction as often as necessary over the course of your movie.

To preview surround sound while editing in Studio, your PC's sound card must be connected to one of:

- A sound system that includes a decoder with Pro Logic or Pro Logic 2 compatibility, such as a powered speaker system with Pro Logic support or a Pro Logic-compatible AV receiver.
- A sound card and speaker system with Dolby Digital 5.1 compatibility.

For best results a digital audio connection (RCA or optical) is recommended.

Note: Even if you cannot hear your surround mix when previewing, it will still appear on your DVDs, but a surround preview allows more accurate mixing.

A surround soundtrack can be output to the DVD in either of two forms:

- In Dolby Digital 5.1 format, each of the six surround channels is stored discretely on the disc and will be routed directly to the corresponding speaker when played back on a full 5.1 surround playback system.
- In Dolby Digital 2.0 format, the surround mix is encoded onto two channels. When your DVD is played back on systems with a Pro Logic or Pro Logic 2 decoder, and a 5.1 or better speaker layout, the original surround information is recreated. On other systems, the encoded soundtrack will be heard as conventional stereo.

The Timeline audio tracks

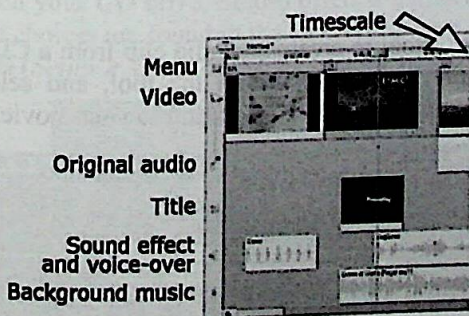
The Movie Window's Timeline view contains several audio tracks:

Original audio track: This contains the audio captured along with your video clips. It is sometimes called "synchronous" audio because it is recorded simultaneously with the *video* track.

Overlay audio track: The original audio for video clips on the *overlay* track.

Sound effect and voice-over track: Sound effects and voice-overs are the typical content on this track. Sound effects are brought into your project from the Sound Effects section of the Album (see "The Sound Effects section" on page 44). Voice-overs are created with the *Voice-over* tool (described on page 163).

Background music track: Use this track to include mp3 or wav audio files, SmartSound background music generated by Studio, and music (or other content) from audio compact disks (CDs). Audio files are imported via the Sound Effects section of the Album (see page 44). Create SmartSound clips with the *SmartSound* tool, and CD audio clips with the *CD audio* tool (see "The *SmartSound* tool" on page 162 and "The *CD audio* tool" on page 160).



The Timeline audio tracks: original audio, sound effect and voice-over, and background music. A fourth audio track appears when the overlay track is visible; it contains the original audio for video on that track.

Switching audio tracks

Although the audio tracks do have their specialized roles, as described above, these mainly control the choice of track where new clips will appear. Original audio will always be placed on the *original audio* track when a new video clip is brought in; new voice-overs will always be created on the *sound effects and voice-overs* track; and new CD audio and SmartSound clips will be added to the *background music* track.

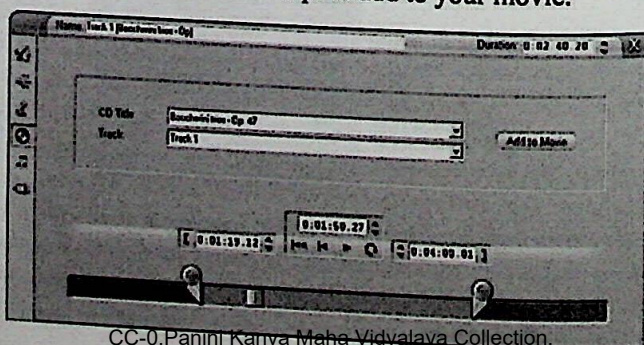
Once a clip has been created, however, you can move it to a different audio track if it is convenient to do so: each track is actually able to accommodate any type of audio clip. This gives you the flexibility to use two sound effects simultaneously, for example, simply by placing one of them on the *background music* track.

The only audio track with special status is *original audio*, either for the main *video* track or, when it's in use, the *overlay* track. By default, audio clips on this track are edited in parallel with the contents of the *video* track at the same time index. To treat the audio as a separate clip, lock the *video* track (by clicking the padlock icon on the right side of the Movie Window). See "Advanced Timeline editing" on page 72 for more information.

The CD audio tool



Use this tool to create an audio clip from a CD track. You can preview tracks within the tool, and select either a whole track or an excerpt to add to your movie.



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If there is a CD in the drive that you have not previously used in a Studio project, Studio will ask you to enter its name before continuing. The controls on the tool will become available only when Studio can offer at least one entry on the *CD Title* dropdown list.

Select the CD from which you wish to capture audio in the *CD Title* dropdown list, and a track on that CD from the *Track* list. Since *CD Title* is also an editable text field, you can change the name by which Studio refers to this CD, if desired. The name change applies to both the current and future sessions.

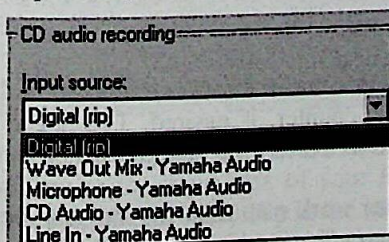
Having selected the CD and track, you can now optionally trim the clip and give it a custom name using the other controls on the tool. These controls are common to most audio clip types, and are used for editing as well as creating clips. They are covered on page 166 under “Trimming with the *Clip properties* tool”.

Finally, click the *Add to Movie* button. Studio creates the new clip on the *background music* track beginning at the current time index (as shown by the Timeline scrubber and the preview frame in the Player).

The first time you preview the portion of your movie that contains the new clip, Studio will ask you to insert the CD (if it is not already in the drive), so that the audio data can be captured. You won’t need to repeat this step subsequently unless you lengthen the clip.

CD recording options

Depending on your CD drive, Studio offers a number of recording options. The choices are found in the *CD, Voice-over and Surround* options panel (*Setup > CD, Voice-over and Surround*):



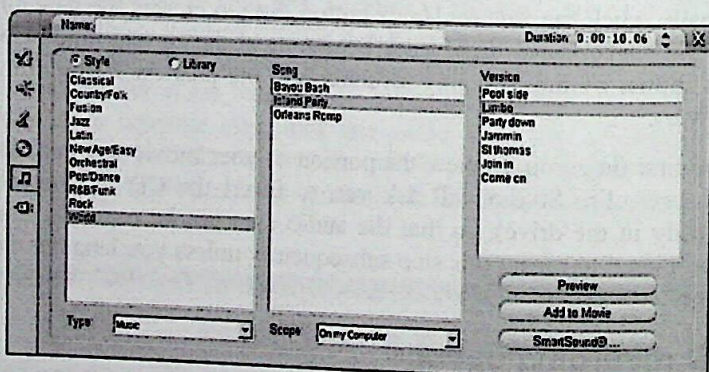
The default method is digitally “ripping” from your CD to Studio. If you have an older CD drive that can’t transfer the audio digitally, Studio lists alternative options based on the capabilities of your system’s audio hardware.

The SmartSound tool



SmartSound automatically creates background music in the *style* of your choice. Within that style, you select one of several *songs*, and within that song, any of a number of *versions*. The list of versions available also depends on the duration of background music you specify.

To create music for a particular set of clips, select those clips before opening the *SmartSound* tool. (To select your whole movie, use *Edit > Select All* or press Ctrl+A.) The total length of the selected clips will determine the initial setting for the music duration, though you can modify the value at any time by trimming on the Timeline or directly editing the *Duration* counter in the tool.



In the *SmartSound* tool, choose a style, song and version from the lists provided. Each style offers its own selection of songs, and each song its own selection of versions. Use the *Preview* button to audition the song while the tool is open.

Enter a name for the clip in the *Name* field and adjust its duration with the *Duration* counter, if desired. The music clip you create will be adjusted to fit exactly the duration you select.

If you would rather work with SmartSound sound effects instead of songs, select *Sound effects* rather than *Music* on the *Type* dropdown list.

You can change the selection of songs available to you by choosing a different option on the *Scope* dropdown list. Choosing *All* will

Digitized by eGangotri
give you access to the entire SmartSound catalog, if you have an Internet connection. You can preview any of the songs, and purchase any that your movie may require.

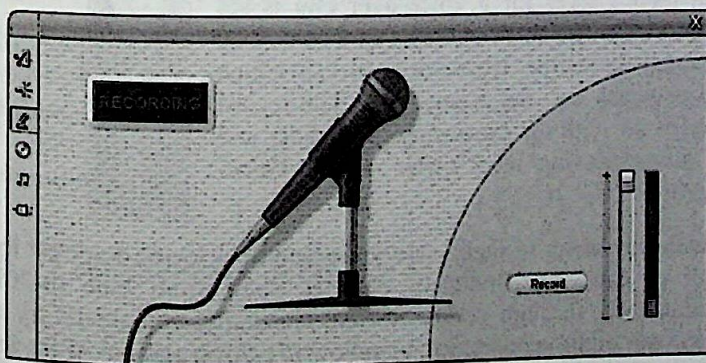
When you have made your choice, click the *Add to Movie* button. Studio creates the new clip on the *background music* track beginning at the current time index (as shown by the Timeline scrubber and the preview frame in the Player).

The *SmartSound* button at the bottom right of the tool opens a dialog with options and tools for maintaining your SmartSound library.

The Voice-over tool



Recording a voice-over in Studio is as easy as making a telephone call. Just open the *Voice-over* tool, click *Record* and speak into the microphone. You can narrate as you watch the movie play so your words match the action on the screen. You can also use the tool as a quick way of capturing ambient music or home-made sound effects via your microphone.



Before you can record audio using the *Voice-over* tool, you need to connect a microphone to the input jack of your PC sound board. You must also have at least one video clip in the Movie Window.

Review the video scenes in your movie and decide where you want the voice-over to begin and end. When you are ready, open the *Voice-over* tool. Note that the recording lamp – the dark rectangle in the upper left of the above illustration – is not lit.

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Select your starting point on the Movie Window Timeline. You may do this by selecting a clip, playing the movie and stopping it at the desired point, or by moving the Timeline scrubber.

Position the microphone for use and try speaking a test phrase to check your recording level (see "Voice-over level" below). When you are satisfied, click the *Record* button (which toggles to a *Stop* button). Wait for a few moments as the recording lamp first signals **STAND BY** then steps through a 3-2-1 countdown.



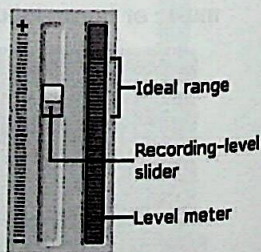
When the recording lamp signals **RECORDING**, and the movie begins to play back in the Player, perform your narration.

RECORDING

Finally, click the *Stop* button. The lamp goes out, and the voice-over clip is automatically placed on the *sound effects and voice-overs* track. Review the clip by selecting it then clicking the *Play* button.

Voice-over level

The record level for a voice-over clip is set when you create the voice-over and cannot be changed thereafter. However, you can adjust the playback volume at any time. The record level is set with the *Recording level* slider and its accompanying level meter on the *Voice-over* tool.

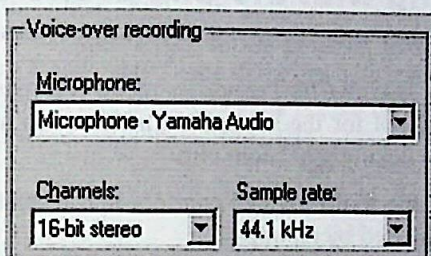


Watch this meter to make sure your recording levels don't get too high or low. The indicator changes color from blue (0-70% modulation), through yellow, to red. Generally, you should try to keep your audio peaking in the yellow (71-90%) and out of the red (91-100%).

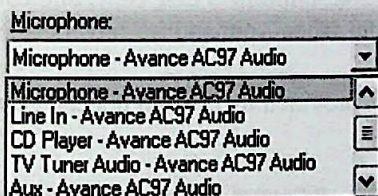
Voice-over recording options

The Studio setup dialogs include several settings that affect your recording configuration and quality. This section provides a brief summary. See "CD, Voice-over and Surround settings" on page 207 for detailed information.

To access these options select **Setup > CD, Voice-over and Surround** from the main menu bar.



The *Microphone* dropdown list on this dialog lists the multiple ways a microphone can be connected to your particular sound card. The entries on the list should look something like the following, from a system with an Avance AC97 sound card:



Choose from this list, then connect your microphone in the manner indicated (e.g. *Microphone* or *Line In*).

The *Channels* and *Sample rate* adjustments on the options dialog control the quality of voice-overs or other recorded audio. Set them at the highest quality level you anticipate needing, but keep in mind that increasing quality requires more disk space.



TRIMMING AUDIO CLIPS

As with other clip types, you can trim audio clips either directly on the Timeline or by using the *Clip properties* tool. See “Trimming on the Timeline using handles” on page 65 for a discussion of the first method.

Most types of audio clip can be trimmed from a minimum of one frame up to the full original length of the clip content. SmartSound clips can be trimmed on the Timeline down to as little as one second, and upward without limit.

Trimming with the *Clip properties* tool

The *Toolbox* ➤ *Modify Clip Properties* menu command invokes the *Clip properties* tool for the selected clip. You can also access the tool by double-clicking any audio clip.

To begin with, the tool provides controls that let you view or edit two properties shared by all clips:

- To set the duration of the clip, change the value in the *Duration* counter.
- The *Name* text field lets you assign a custom name to the clip to replace the default one assigned by Studio. The clip name is used by the Movie Window's List view, and can also be viewed as a fly-by label when your mouse hovers over the clip in the Storyboard view.

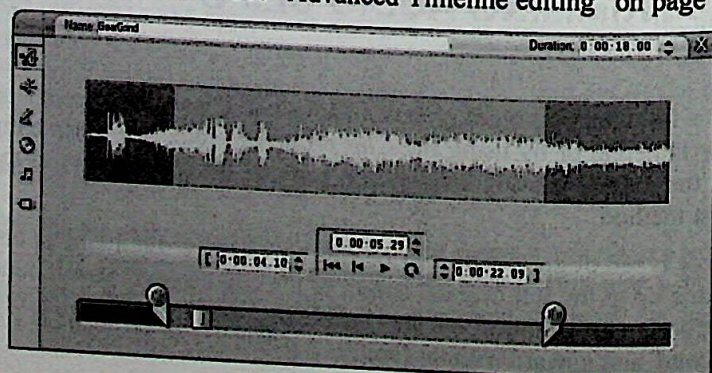
The other controls provided by the tool depend on the type of audio clip you give it.

Original audio, sound effects and voice-overs

The *Clip properties* tool provides the same kind of trimming controls for sound-effect and voice-over clips as for video clips, but displays a graph of the audio waveform instead of visual preview areas.

To learn how to trim with these controls, see "Trimming with the *Clip properties* tool" on page 69.

Remember that clips on the *original audio* and the *overlay audio* tracks can only be edited independently when the corresponding video track is locked. See "Advanced Timeline editing" on page 72.



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CD Audio

For CD Audio clips, the *Clip properties* tool uses the same trimming controls as above, but additionally provides dropdown selectors for *CD Title* and *Track*. You can use these to change the source of the clip at any time. *CD Title* is also an editable text field, so you can enter the actual title of the CD.

SmartSound®

SmartSound clips can be edited to almost any length, except that very short clips at some particular durations may not be available in every combination of Style and Song. This tool is essentially identical to the tool for creating SmartSound clips (described under “The *SmartSound* tool” on page 162), except that the *Add to movie* button is replaced by the *Accept changes* button.



AUDIO VOLUME AND MIXING

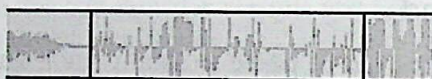
The audio levels and stereo positioning of individual clips can be adjusted either directly on the Timeline, or with the *Volume and balance* tool. Each technique offers its own advantages. Adjusting on the Timeline gives you a good sense of time versus volume or balance, whereas the *Volume and balance* tool facilitates *mixing* – separately adjusting the volume and stereo balance of each of the audio tracks.

For disc authoring, the *Volume and balance* tool lets you choose to create a surround soundtrack, rather than stereo. The tool lets you dynamically position any of the audio tracks from front to rear as well as left to right.

Availability: Surround sound is not supported in the SE and QuickStart versions of Studio.

Anatomy of an audio clip

An audio clip icon on the Timeline has several parts. The boundaries of each clip are denoted by vertical bars. The actual content of the audio is indicated by a waveform graph:



Waveform graph excerpt from three neighboring clips.

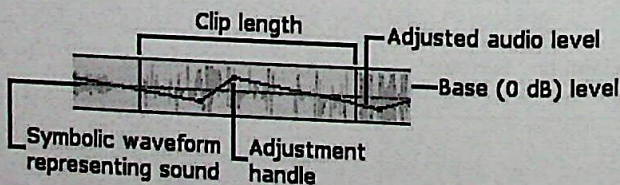
The appearance of the waveform graph tells you something about the character of the sound. A *quiet* sound has a narrow waveform, close to the centerline of the clip. A *loud* sound has a waveform with larger peaks and troughs, reaching almost to the borders of the clip. A *continuous* sound, such as a car engine, has many pulses packed closely together. A *staccato* sound has brief pulses separated by silences where the waveform is a horizontal line.

Adjustment lines

The blue *volume line* graphically models the volume changes you have made to the track and clip. If you have not adjusted the volume at all, the line runs straight along the clip at about three-quarters of the clip height. This is the "zero gain" (0 dB) level, where the clip's original volume has been neither increased nor decreased.

If you raise or lower the volume of the entire track, the volume line remains horizontal, but is now higher or lower than the zero-gain base level.

Finally, if you make volume adjustments *within* the clip, the line consists of sloping segments that meet at *volume adjustment handles*.



Unlike the waveform graph, or the adjustment lines for balance and fade (see below), the volume adjustment line is scaled *logarithmically*. Perceived volume varies logarithmically with the strength of an audio signal, so this feature allows the adjustment line to model more accurately what you really hear. For instance, an upward-sloping line segment will produce a smooth, steady fade up from the starting to the ending level.

The green *stereo balance line* and the red *front-back balance ("fade") line* work similarly to the volume line, except that in both cases the neutral position is the vertical center of the clip, and the adjustment scale is linear.

Raising the stereo balance line positions the audio clip's output further to the listener's left, while lowering it positions the clip further to the listener's right. Similarly, raising the fade line moves the clip away from the listener, and lowering it brings the clip towards the listener.

Note: You can only view and edit a clip's *fade* line when the *Volume and balance* tool is in *surround* mode. The effect of adjusting the line can be previewed only on systems where surround-sound playback is available.

To select which of the three adjustment lines is currently displayed, use the audio clip's right-button context menu:

- ✓ Select Volume Display
- Select Balance Display
- Select Fade Display

Availability: Surround sound is not supported in the SE and QuickStart versions of Studio.

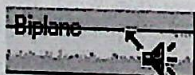
Adjusting audio on the Timeline

Audio levels can be adjusted directly within a clip on the Timeline. Use the mouse pointer to adjust the blue volume line or either of the balance lines (see “Anatomy of an audio clip” on page 168).

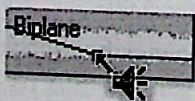
When you add a new audio clip to the Timeline:

- The volume adjustment line of the newly-created clip connects the lines from the preceding and following clips if any are present.
- If no volume adjustments have been made to other clips on the track, the volume line through the new clip is horizontal. Its height reflects the overall track volume as set in the *Volume and balance* tool.
- If no volume adjustments have been made either to other clips or to the overall track volume, the volume line through the new clip is at three-quarters height.

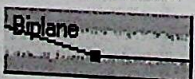
To adjust the volume of a clip on the Timeline, select it (by left clicking), then move your mouse pointer close to the line. The *volume adjustment cursor* will appear:



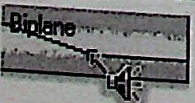
Click the left mouse button, and drag up or down within the clip. The volume line bends as it follows the mouse.



When you release the mouse, Studio creates an *adjustment handle* on the volume line.



When your mouse pointer is positioned over an adjustment handle on a selected clip, a highlighted version of the volume adjustment cursor appears. With this cursor, you can click and drag the adjustment handle both vertically and horizontally.



Right-click on an adjustment handle to access the context menu command *Delete volume setting*. This command removes one adjustment handle. Use *Remove volume changes* to remove all the handles from the clip.

Adjusting balance and fade

The left-right and front-back balance lines have the same editing features as the volume line just discussed, except that with them the neutral setting is at half the clip height, instead of three-quarters as it is for volume.

In the case of left-right (stereo) balance, adjusting the line upwards from the center positions the audio further to the left. With front-back balance ("fade"), adjusting the line upwards moves the apparent source of the audio away from the listener, while adjusting the line downwards brings the audio closer (towards the rear speakers).

Removing changes

An individual adjustment handle can be deleted with one of the *Delete setting* commands on the handle's right-button context menu:



- Delete Volume Setting
- Delete Balance Setting
- Delete Fade Setting

To remove *all* audio adjustments of one type from a selected clip, select the appropriate command from the clip's context menu:



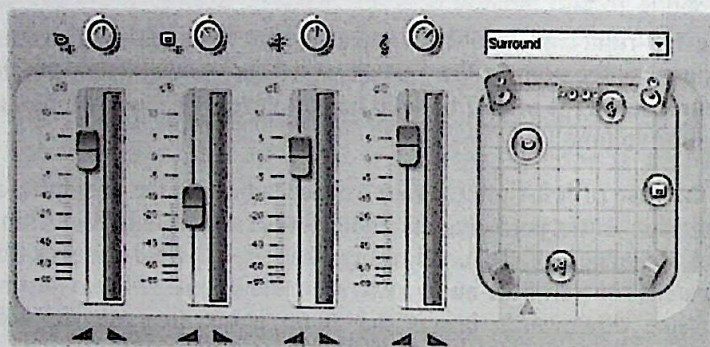
- Remove Volume Changes
- Remove Balance Changes
- Remove Fade Changes

The Volume and balance tool

Compared to adjusting audio on the Timeline, the *Volume and balance* tool offers a greater degree of adjustment functionality organized into one convenient location. It also provides both left-

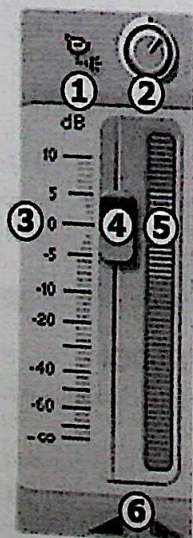
right and surround-sound balance controls. The tool operates in a similar way to a traditional audio mixer.

Availability: Surround sound is not supported in the SE and QuickStart versions of Studio.



The *Volume and balance* tool provides individual level controls for each of the audio tracks: *original audio* (left in illustration), *overlay audio*, *sound effect* and *voice-over*, and *background music* (right). The *overlay audio* controls are displayed only when the *overlay* video and audio tracks are open in the Movie Window.

The *balance control*, located in the right-hand part of the tool, can be used in either of two modes, as selected in the dropdown list above: *stereo* (one-dimensional) and *surround* (two-dimensional).



Each audio track has its own set of level controls. The set for the *original audio* track is shown at left.

The individual controls and displays include a *track mute* button ①. When this button is in its *down* position, no audio clips from the track will be used in your movie. The *track mute* button's icon has a second purpose: it identifies which track the level controls apply to. This is the only visible point of difference amongst the three sets of controls.

The *track level* knob ② raises or lowers the overall volume for the track. It therefore affects the vertical position of the volume adjustment lines on all clips on the track, but does not change their contour. Click on the knob and

drag it with a clockwise rotation (up to the 2 o'clock maximum position) to increase the volume. Use a counterclockwise rotation (down to the 6 o'clock minimum) to lower the volume.



Level knobs, full off (L), default (C) and full on (R).

The track's *relative level scale* ③, with its associated *fader* ④, are calibrated in decibels (dB). The 0 dB mark corresponds to the level at which the clip was recorded. Each increase of 3 dB doubles the perceived volume, and each decrease of 3 dB halves it.

The position of the fader knob shows the volume level at the current playback position in your movie, relative to the level at which the current clip was recorded. Drag the knob up or down to modify the level. The knob is "grayed" (disabled) if there is no clip on the track at the current time index. If the track is muted, the knob is grayed and set to the bottom of its range. Adjusting the fader results in a volume adjustment handle being added to the track as described above.

A track's playback volume contour, or *envelope*, combines the overall track level with the relative level at each point on the track. This combined level, which is shown graphically by the volume adjustment lines on audio clips, is applied to the actual audio data to produce the track's output level, as represented on the *level meter* ⑤, which illuminates during playback to show the level at the current time index. To avoid audio "clipping" – the unpleasant sound produced by attempting to set volume levels outside the range of a digital signal – ensure that the meter level never quite reaches the top of the bar.

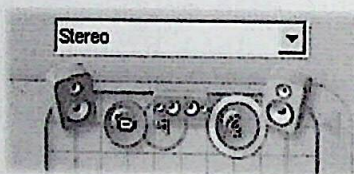
The *fade* buttons ⑥ produce a fade-in from or a fade-out to the current position of the movie. For a visual confirmation of their effect, watch the behavior of the clip's volume adjustment line when the fade buttons are clicked. The fade duration is variable from zero to fifty-nine seconds. Adjust it in the *Edit* options panel (*Setup > Edit*) under *Volume fades*. Fades are not available too close to the beginning or end of a clip.

The balance control

This control has two modes, *stereo* and *surround*, which you select from the dropdown list above the control.

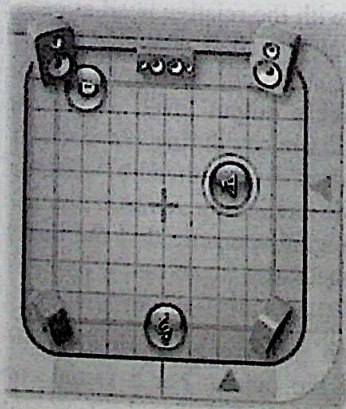
In either mode, the position of each track at each point in the movie is shown by a corresponding speaker icon. The icon matches the one on the muting indicator for the corresponding track.

In *stereo* mode, you set the position of the track by dragging its speaker icon left and right between a pair of main speakers:



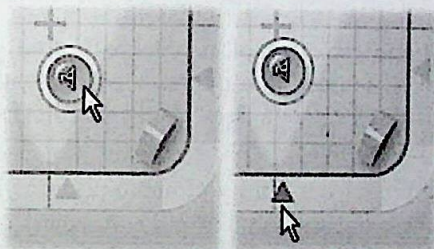
The original audio track (L) and the background music track (R), on opposite sides of a stereo mix. The sound effect and voice-over track icon is shown as a gray outline (left of center), indicating either that the track has been muted or that there is no clip on the track at the current time index.

In *surround* mode, you can position each track from front to back ("fade") as well as from left to right ("balance"). Each track can be independently placed anywhere within the rectangular listening area.



Surround mode: Here, the original audio track has been placed farthest from the listener, near the left front speaker. The sound effect and voice-over track is on the right, closer to the listener. The background music track is centered, and closer still.

There are two ways to set the position of a track's icon in the balance control. Either click on any track's icon and drag it to the desired position, or move it by dragging the triangular *locator knobs* below and to the right of the control. The locator knob below the balance control adjusts the left-right positioning of the audio output from the currently-selected clip, while the knob on the right adjusts the front-back positioning.



Drag track icon directly (L) or with locator knob (R).

Viewing volume and balance contours

Each audio clip in your project displays a contour line showing one of its volume, left-right balance or front-back balance. To select which of the three types of line is displayed, use the commands on an audio clip's right-button context menu (see "Anatomy of an audio clip" on page 168).

The contour lines can be modified directly on the Timeline using *adjustment handles*. For details, see "Adjusting audio on the Timeline" on page 170.

Note: You can only view and edit a clip's *fade* (front-back balance) line when the *Volume and balance* tool is in *surround* mode.



AUDIO EFFECTS

You can modify any audio clip in your project using Studio's plug-in audio effects, which are accessed with the *Audio effects* tool in the Toolbox.

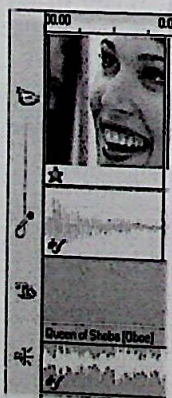


The *Audio effects* tool is the sixth tool in the Audio toolbox. The operation of this tool is identical to that of the *Video effects* tool. See "Using video effects" (page 79) for a complete description.

As with video effects, your library of audio plug-ins is expandable. Any audio effect using the popular VST standard can be used in Studio just like the effects supplied with the program.

Availability: Audio effects other than *Noise reduction* are provided as locked, "watermarked" content in the SE and QuickStart versions of Studio. The watermark graphic, and periodic beep on the soundtrack, can be removed with the appropriate activation key. See page 9 for details.

Icons for audio effects



In Timeline mode, any special effects you have applied to an audio or video clip are indicated by small icons along the bottom of the clip. These correspond to the effects groups shown by the *Add new effect* browser in the *Audio effects* and *Video effects* tools. You can open the appropriate tool for parameter editing by double-clicking any of the icons.

In the illustration, the *Noise reduction* effect has been applied to both audio clips. The star icon below the video clip shows that one or more of the effects in the "Fun effects" group has been applied to it.

The basic audio effects

Studio's basic set of audio effects include the *Noise reduction* filter and a variety of VST plug-ins. Some of the latter use their own parameter editing windows instead of the parameters panel in the *Audio effects* tool and the *Video effects* tool.

Noise reduction

This advanced filter suppresses unwanted noise in any audio clip. The filter responds dynamically to the changing noise conditions within the clip. The preset you choose provides the starting point from which the adaptive algorithm proceeds.

You can often further improve your results by adjusting the *Noise reduction* and *Fine tuning* parameters. There is a lag of about a second before any new setting has an audible effect, so you should make changes in small amounts then pause to check if there is an improvement.

Noise Reduction	<input type="text" value="0.40"/>	0.40
Auto adapt	<input checked="" type="checkbox"/>	
Fine tuning	<input type="text" value="0.00"/>	0.00
Remove wind	<input type="checkbox"/>	

Noise reduction: When a camcorder is used outdoors with the actors distant from the microphone, the “source noise” may be very high, and to make matters worse the internal noise of the camcorder may be amplified to intrusive levels. If a lapel microphone connected to the line input of the camcorder were used when taping the scene, however, the source noise could be quite low. Adjust this control to match the noise conditions of the actual signal.

Fine tuning: This controls the amount of cleaning to be used. It is only needed when the *Noise reduction* level is low, since at higher levels the noise has already been eliminated.

Auto adapt: When this option is checked, the filter automatically adjusts to changes in the type or amount of noise in the clip. The *Fine tuning* is not used when *Auto adapt* is active.

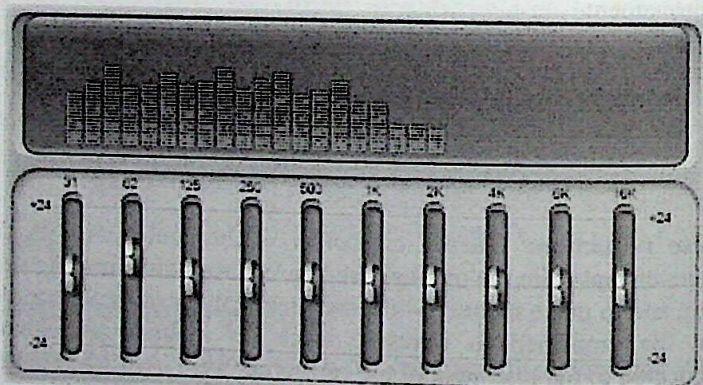
Remove wind: This checkbox engages a filter that reduces wind noise and similar unwanted background sounds in the audio clip.

Note: The *Noise reduction* filter will help with a wide range of material, but it is not a panacea. Your results will vary depending on the original material and the severity and nature of the problems.

Equalizer

This effect is similar in concept to the treble and bass “tone” controls on audio equipment, but provides a much finer degree of adjustment. It divides the audio spectrum into ten *bands*, each centered on a different sound frequency.

Note: In musical terms, each equalization band covers one *octave*, and the center frequency is close in pitch to the note B.

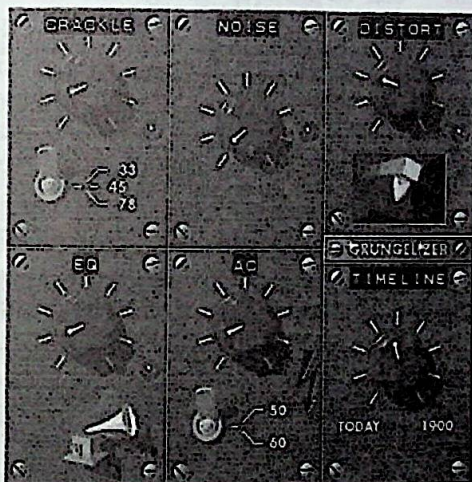


The sliders let you increase or decrease the contribution of each band's frequencies to the total sound over a range of 48 dB (-24 to +24). The adjustment to a band is applied full strength at the center frequency, and tapers to zero in either direction.

The display above the slider shows the activity across the audio spectrum as your project is played back.

Grungelizer

The Grungelizer adds noise and static to your recordings. It can make your clips sound as though you were hearing them on a radio with bad reception or a worn and scratched vinyl record.



Crackle: This dial adds crackle to create that old vinyl record sound. The farther to the right you turn the dial, the more crackle is added.

RPM switch: When emulating the sound of a vinyl record, this switch lets you set the turntable speed in revolutions per minute (33, 45 or 78 RPM).

Noise: This dial regulates the amount of static noise added.

Distort: Use this dial to add distortion.

EQ: Turn this dial to the right to cut off the low frequencies, and create a more hollow, lo-fi sound.

AC: This emulates the constant, low hum of AC current.

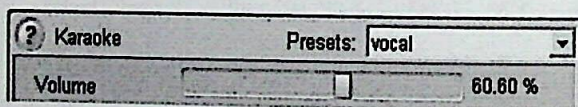
Frequency switch: This sets the frequency of the AC current (50 or 60 Hz), and thus the pitch of the AC hum.

Timeline: This dial regulates the amount of overall effect. The farther to the right (1900) you turn this dial, the more noticeable the effect.

Karaoke

Apply this effect to clips such as mp3 songs or audio CD tracks to remove the main vocal from the performance. What remains – the accompaniment – can be used as background music, or as the backing for your own vocal in a voice-over or video clip.

The *Karaoke* effect depends on the fact that the main vocal part in a recording is usually divided about equally between the two stereo channels. The plug-in digitally compares the channels and removes the common part from both. Not all recordings are well suited for karaoke use.



Volume: This slider lets you adjust for variations in the total output volume that may be introduced by *Karaoke* processing. Move the slider towards the left if the audio is too loud with the filter applied, or towards the right if it is too soft.

Leveler

This effect helps compensate for a common problem in recording audio for video productions: the imbalance in the recorded volume of different elements in the original audio. For instance, your commentary as you shoot the video may be recorded at such a high level that it overwhelms other sounds at the location.

The trick in using the *Leveler* is to find a target volume somewhere between that of the loud and soft audio in the original clip. Below that volume, *Leveler* acts as an *expander*, increasing the original level by a fixed ratio. Above the target volume, *Leveler* acts as a *compressor*, reducing the original level. With careful adjustment of the parameters, the internal balance of the audio can be significantly improved.

Target level: This slider sets the target volume.

Compression: Move this slider to the right to increase the amount by which the louder sounds are reduced.

Threshold: This slider controls the minimum level at which expansion will be applied. It is used to avoid expanding faint background sounds into audible noise.

Expansion: Move this slider to the right to increase the amount by which the softer sounds are amplified.

Reverb

The *Reverb* effect simulates the effect of playing back the source sound in a room of a given size and sound reflectivity. The interval between the arrival of the original sound at the listener's ears and the first echoes is greater for a large room than a small one. The rate at which the echoes die away depends on both the room size and the reflectivity of the walls.

The presets for *Reverb* are named for the type of room they simulate – from the passenger cabin of a car all the way up to a huge underground cavern.

? Reverb		Preset: <input type="text" value="hall"/>
Initial Delay	<input type="text" value="0.100"/>	
Room Size	<input type="text" value="23.48"/>	
Damping	<input type="text" value="28.03"/>	
Duration	<input type="text" value="99.99"/>	
Mix	<input type="text" value="82.57"/>	

Initial Delay: This slider sets the amount of delay from the start of the sound until the reverb kicks in. For naturalistic results, a smaller value would be used when modeling a smaller room.

Room Size: This slider sets the size of the modeled room. A larger room sounds more spacious because of the longer interval between reflections of the sound waves.

Damping: This slider controls a damping factor that reduces higher-frequency reflections as the sound waves bounce off surfaces in the virtual room. More damping generally produces a warmer sound, less damping a brighter sound.

Duration: This slider controls the length of time it takes from the onset of a particular sound until the reverberations die away. It corresponds to the efficiency with which sound is reflected from the walls and other contents of the virtual room.

Mix: This slider controls the amount of the original sound that is mixed into the output from the effect. When the slider is all the way to the left, only the original sound is heard.

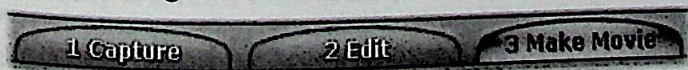
CHAPTER 12:

Making your movie

Studio gives you a variety of ways to share your video productions. This chapter explains how to:

- Attach a DV or MicroMV camcorder or a DV VCR (MicroMV with Windows XP only)
- Connect an analog (VHS or S-VHS) camcorder or VCR
- Connect a TV set or video monitor
- Output your movie to videotape
- Save your movie as an AVI file
- Save your movie as an MPEG file
- Share your movie via the Internet
- Save your movie as a Windows Media or RealVideo file
- Output your movie to disc for playback on a DVD, VCD or S-VCD player
- View a DVD, VCD or S-VCD movie on a computer

All these operations are available in Make Movie mode, which you access by clicking the *Make Movie* button at the top of the screen.

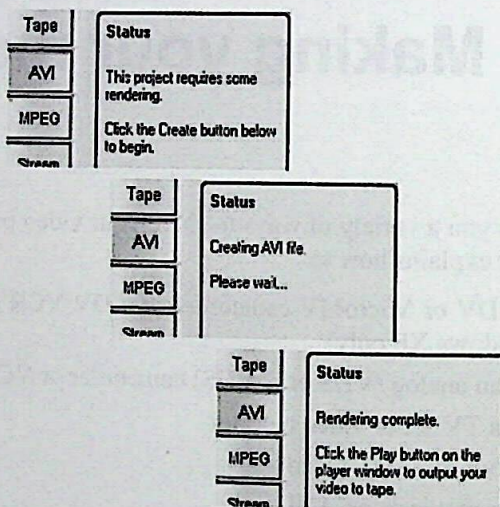


Preparing your movie for output

Before your movie is actually ready for output some preprocessing will generally be required:

- If your movie includes clips that were captured in preview quality, Studio will prompt you to load your source tape(s) into your DV camcorder or VCR. Studio will then recapture the clips at full resolution.

- Studio will need to render (generate video frames for) any transitions, titles, disc menus and video effects you've added to your movie, unless they have already been rendered in the background (see "Edit settings", page 204). If all or part of the movie was captured in MPEG format, that footage must be rendered in its entirety.



The Make AVI status panel before, during and after rendering.

When Studio has completed its batch capture and rendering, the Make Movie *Status* panel will indicate that your movie is ready for output.

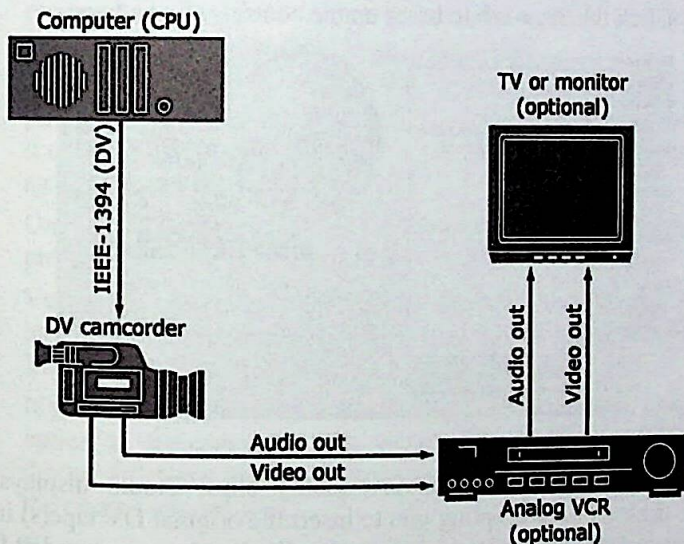
Output to a camera or video recorder

... via IEEE-1394 cable

If your recording device has a DV input, just connect it to your digital video card with an IEEE-1394 (or "i.LINK") cable. The connector at the camcorder end should be labeled DV IN/OUT.

Note: On machines that don't support recording back to the camcorder, including many PAL devices, the DV connector is called simply DV OUT.

If you have a Studio product with an analog (TV or video) output, such as Studio DVplus or DC10plus, connect the video outputs of the capture card to the inputs of the video recorder and the audio outputs of the sound card (or Studio DVplus) to the audio inputs of the video recorder.



Connecting a TV set or video monitor

Many camcorders have an integrated display, making it unnecessary to attach a video monitor.

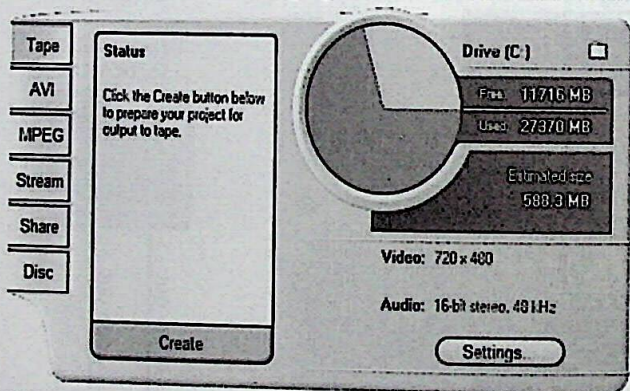
Otherwise, to view your movie as it is recorded, a TV set or a video monitor must be attached to the video outputs of your recorder. Video outputs are not always available on DV camcorders.

Output your movie to videotape

Switch to Make Movie mode, and check that your camcorder or VCR is connected and ready to record your movie.

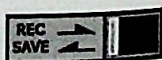
To output your movie to videotape:

1. Click the *Tape* tab to bring up the controls shown here:



2. Click the *Create* button.
3. If you have used preview-quality clips, Studio displays a dialog box prompting you to insert the original DV tape(s) into your DV playback device so that clips can be recaptured at full quality.

It's good practice to slide the record-inhibit tab on your master tapes to "Save" to ensure there's no accidental recording over original material.



Note: Studio relies on continuous, uninterrupted timecode to recapture these clips. If your original tapes have discontinuous timecode (a zero timecode at a location other than the beginning of your tape), you must manually cue to the portion of the tape that holds the clip(s). Studio will then perform an accurate recapture of the clip(s) and provide you with trim handles. (You can see the extra frames by opening any recaptured clip with the *Clip properties* tool.)

4. The parts of your movie that were captured in MPEG format must now be rendered.

For other captured footage, Studio begins the process of Intelligent Rendering, whereby it renders only the parts of your

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movie that actually require it – video effects, transitions, overlays and disc menus, for example – but does not re-render any unaltered original footage. Intelligent Rendering saves you time and disk space.

Intelligent Rendering is entirely automatic, except that you may be asked to insert any audio CDs that are part of your movie. During Intelligent Rendering, Studio tells you what part of the Intelligent Rendering process it is performing via messages in the Status window, concluding with a message telling you Intelligent Rendering is complete.

You can terminate the Intelligent Rendering process at any point by clicking the *Cancel* button. Once canceled, however, it cannot be resumed: the make tape operation must be started again at the beginning.

Once rendering is complete, Studio requires a few seconds to prepare for output to your camcorder or VCR.

5. Verify that the camcorder/VCR is powered on, and that you have inserted a tape cued to where you wish to begin recording. You now have two options:

If you record your movie onto a DV tape, Studio gives you the option to automatically start and stop recording on the DV device. Click the *Settings* button then activate the check box in the *Output options* area.

If you are recording onto analog tape, start your VCR recording now.

Finally, click *Play* in the Player.

Copying an AVI file to tape

Studio's *Create Tape* interface also includes support for transferring an AVI file directly to videotape. See "Copying an AVI file to tape" on page 195 for details.

Save your movie as an AVI file

In some instances, you may wish to output your movie in AVI file format. Generally, AVI files are larger than MPEG files, but AVIs can be played back on a wider range of computers.

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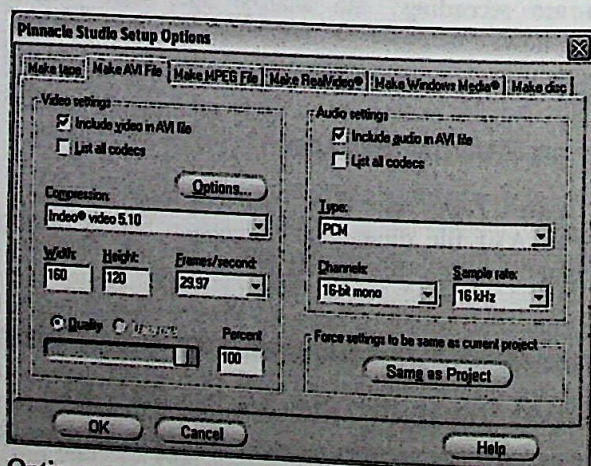
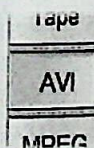
If you choose to save your movie as an AVI file, Studio gives you control over several codec settings. Files can be greatly reduced in size; however, do keep in mind the trade-off between file size and quality: the more you compress, the more you reduce quality.

Both video and audio compression are adjustable. Video compression adjustments include frame size, frame rate and data rate (after compression). For audio, you can select monaural (single channel) instead of stereo, and adjust the bit depth and sampling rate.

The default codec included with Studio is the Studio DV codec. If you wish to output your movie in another format, you can use any DirectShow-compatible codec installed on your PC, as long as that codec is also installed on the PC that will play your digital movie.

To save your movie as an AVI file:

1. Switch to Make Movie mode by clicking the Make Movie tab at the top of the Studio main window. The Make Movie controls appear. Click the *AVI* tab.
2. Click the *Settings* button. Verify that the *Include video* and *Include audio* checkboxes are selected. (Note: If you selected "DV Video Encoder" in the *Compression* dropdown, the *Include audio* option is unavailable.)



Options are provided for turning off either the audio or the video. You may want to make an AVI audio-only file for import into another program. Alternatively, you might want to

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omit the audio from a small web-page video in order to minimize the file size.

The remaining options pertain to compression. For more information see "Make AVI file settings" on page 210.

3. Check the Diskometer to make sure you have enough drive space.
4. Click the green *Create AVI file* button. Enter a name for your AVI file when prompted.


The default directory for saving your file is:

C:\My Documents\Pinnacle Studio\My Projects

Click *OK* to start creating the file. To create the AVI, Studio will decode any MPEG video in the project, render any titles, effects and Hollywood FX transitions, then compress the resulting frame using the codec you specified in the *Make AVI File* options panel.

This is generally a slow process: the actual time depends on the speed of your computer and the length of your video.

Checking your results

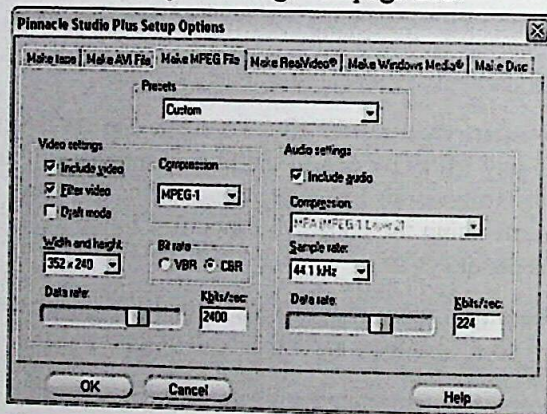
 Once your movie has been rendered, you will probably want to review the results. Click the *open file* button to the left of the *Settings* button, and select the *avi* file you have just created (or any other that you want to view). Windows Media Player will then open and display the file.

Save your movie as an MPEG file

The MPEG-1 file format is supported on all Windows 95 and later PCs. MPEG-2 files can only be played on PCs with MPEG-2 decoder software installed. Generally, MPEG files are smaller than AVI files, and depending on the AVI options used may be of higher quality.

To save your movie as an MPEG file:

1. Switch to Make Movie mode by clicking the Make Movie tab at the top of the Studio main window. The Make Movie controls appear. Click the *MPEG* tab.
2. Click the *Settings* button to bring up the *Make MPEG File* options panel, and choose the preset that meets your need. For more information on the "Custom" preset, see "*Make MPEG file settings*" on page 212.



3. Check the Diskometer to make sure you have enough drive space.
4. Click the green *Create MPEG file* button. Enter a name for your mpg file when prompted.

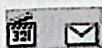
The default directory for saving your file is:

C:\My Documents\Pinnacle Studio\My Projects

Click *OK* to start creating the file. A progress bar on the Player lets you monitor the creation of your movie.



Checking your results



Once your movie has been rendered, two new buttons appear to the left of the *Settings* button. The first of these launches Windows Media Player so that you can check your MPEG movie. The second button is the *Send email* button.

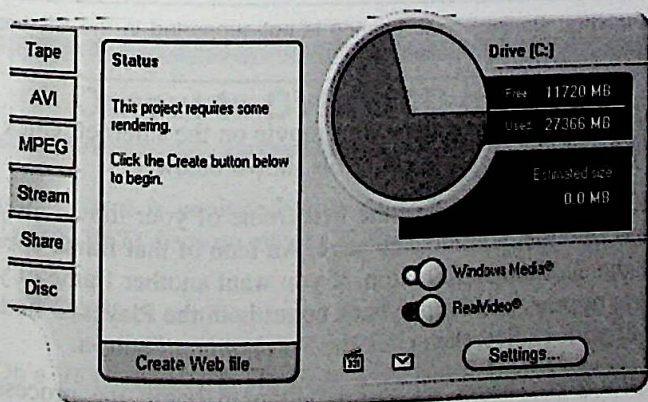
Save as RealVideo or Windows Media

With the RealVideo and Windows Media formats, you can save your movies for playback on the Web. You can share those movies with anyone around the world who has compatible software:

- For RealVideo, the RealNetworks® RealPlayer®, a free download from www.real.com.
- For Windows Media, the Window Media Player, a free download from www.microsoft.com.

To output your movie to RealVideo or Windows Media:

1. Click the *Stream* tab to bring up these controls:



2. Click the *Windows Media* or the *RealVideo* button.

Click the *Settings* button to bring up the options dialog for the file format you have chosen. For more information see "*Make RealVideo file settings*" (page 214) and "*Make Windows Media file settings*" (page 216).

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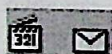
3. Click the green *Create Web file* button.

Type in a name for your **rm** (RealVideo) or **wmv** (Windows Media) file. The default directory in which your file will be saved is:

C:\My Documents\Pinnacle Studio\My Projects

Click *OK* to start creating the file. As usual, the progress bars in the Player give you feedback on the processing of each clip.

Checking your results



Once your movie has been rendered, two new buttons appear to the left of the *Settings* button. The right-hand button of the pair is the *Send email* button. The left-hand one launches RealPlayer or Windows Media Player, depending on the output format you chose.

Clicking the *Send email* button opens a *Choose Profile* dialog box which asks for your email *Send* name, then accesses your email program and attaches your movie to a new message.

Share your movie via the Internet

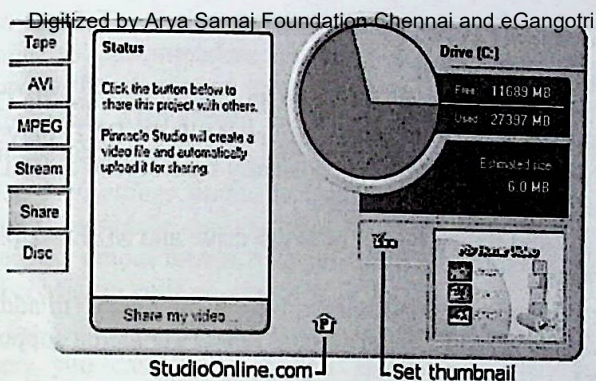
Availability: On-line movie sharing is not supported in the SE and QuickStart versions of Studio.

Studio makes it easy to share your movie on the Internet. Click the *Share* button to bring up the controls shown below:

By default, Sharing displays the first frame of your movie on your personal MyStudioOnline web page. An icon of that frame appears beside the *Set thumbnail* button. If you want another frame of your movie to appear, use the playback controls in the Player to find the frame of your choice, then click the *Set thumbnail* button.

Click the green *Share my video* button to begin the process of sharing your movie.

Your video-sharing account allows you to store up to 10MB (about 5 minutes) of video online. If your movie is too large to fit into your allotted space, a message will appear alerting you. In this case, reduce the file size by reducing the duration of your movie.



Uploading your movie

If this is your first video to share, Studio uses your Internet connection to open the log-in page of Pinnacle Systems' video-sharing web site. Sign up for your personal account by answering the on-screen questions.

Studio then uploads your movie to the web site, where it is converted to RealVideo and Windows Streaming Media formats.

Your browser opens to your personal MyStudioOnline page where you choose a "video postcard" template to display your video, and then send emails to family and friends, inviting them to view your creation.

Output to DVD, VCD or S-VCD

If your system is equipped with a CD burner, Studio can create VCD or S-VCD discs on either CD-R or CD-RW media.

Your VCD discs can be played back:

- On a VCD or S-VCD player.
- On some DVD players. Most DVD players can handle CD-RW media, but many will not reliably read CD-R. A majority of DVD players can handle the VCD format.
- On a computer with a CD or DVD drive and MPEG-1 playback software (such as Windows Media Player).

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Your S-VCD discs can be played back:

- On an S-VCD player.
- On some DVD players. Most DVD players can handle CD-RW media, but many will not reliably read CD-R. DVD players sold in Europe and North America usually cannot read S-VCD discs; players sold in Asia often can.
- On a computer with a CD or DVD drive and MPEG-2 playback software.

If your system has a DVD burner, Studio can create (in addition to the above) DVD discs on any recordable DVD media supported by the drive.

Your DVD discs can be played back:

- On any DVD player that can handle the recordable DVD format your burner creates. Most players can handle the common formats.
- On a computer with a DVD drive and playback software.

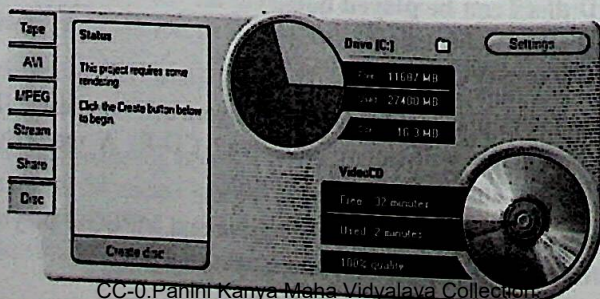
Whether or not you have a DVD burner on your system, Studio also lets you save a *DVD image* – a set of files containing the same information that would be stored onto a DVD disc – to a directory on your hard drive. The DVD image can subsequently be burned to disc.

Studio creates your disc or disc image in three steps.

1. First the entire movie must be *rendered* to generate the MPEG-encoded information to store on the disc.
2. Next, the disc must be *compiled*. In this phase, Studio creates the actual files and directory structure that will be used on the disc.
3. Finally, the disc must be *burned*. (This step is skipped if you are generating a DVD image rather than an actual disc.)

To output your movie to disc, or to a DVD image:

1. Click the *Disc* tab to bring up these controls:



The **Make Disc** control panel is wider than the other output panels to accommodate an extra Diskometer-style display showing the amount of space consumed by your movie on the output disc. Also shown are the length of your movie, and a reminder of the disc-type and quality setting you have chosen.

2. Click the *Settings* button to bring up the *Make Disc* options panel (see “*Make disc settings*” on page 217). There you can select the output format for your movie, set up quality options, and configure your disc burner.

To the left of the *Settings* button is a *Browse for folder* button where you can choose a new location for the storage of auxiliary files generated during the *Make Disc* operation. If you are creating a DVD image, it will also be located in this folder.

3. Click the green *Create disc* button. Studio goes through the steps described above (render, compile, and if necessary burn) to create the disc or disc image you have specified in the settings dialog.
4. When Studio has finished the burning operation, it ejects the disc.

Quality and capacity of disc formats

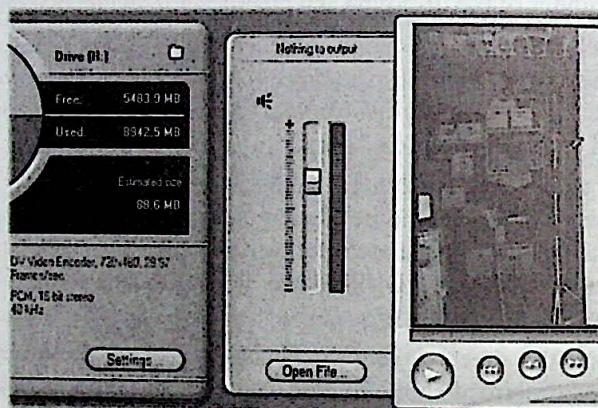
The differences amongst the DVD, VCD and S-VCD disc formats can be boiled down to these rules of thumb regarding the video quality and capacity of each format:

- **VCD:** Each disc holds about 60 minutes of MPEG-1 video, with about half the quality of DVD.
- **S-VCD:** Each disc holds about 20 minutes of MPEG-2 video, with about two-thirds the quality of DVD.
- **DVD:** Each disc holds about 60 minutes of full-quality MPEG-2 video.

Copying an AVI file to tape

When the *Tape* tab is selected in *Make Movie* mode (see “*Output your movie to videotape*”, page 186, and “*Save your movie as an AVI file*”, page 187), a small side-panel opens on the *Player*. The controls on this panel enable you to output an AVI movie directly

to videotape. The *Open file* button lets you select an *avi* file for recording, while the slider adjusts the volume level when the file is being played back. After the file loads, simply click the *play* button on the Player to initiate recording.



Side-panel projecting from Player in Make Tape mode.

APPENDIX A:

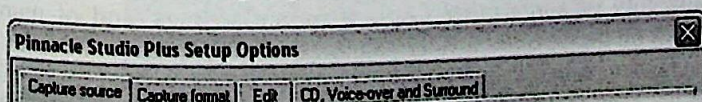
Setup options

Settings are provided to adjust various aspects of Studio's operation. The default values have been chosen to work well for the majority of situations and hardware. However, you may wish to modify them to suit either your work style or your specific equipment configuration.

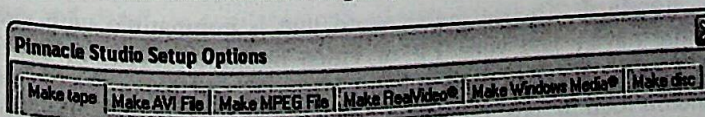
About Studio setup options

Studio's setup options are divided between two dialog boxes, both with several tabbed panels.

The Main Options dialog box has four panels covering options relating to Capture mode and Edit mode. Access this dialog box and activate a particular tab simultaneously by selecting one of the commands in the first group on the *Setup* menu.



The Make Movie Options dialog box has six panels, one for each of the six movie output types. Access this dialog box by selecting one of the commands in the second group on the *Setup* menu.



Option settings in Studio apply to both the current and future Studio sessions. There is no master reset. If you want to return to the factory preset values, use the information in the following sections, which deal with all ten options panels in turn.

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Capture source settings

This panel is divided into three areas: Capture devices, Scene detection during video capture and Data rate.

The changes you make affect all future captures. If you want to configure only one capture session, make sure you restore the old values before the next session.

Capture devices

Studio senses which capture hardware you have installed on your system for both video and audio. If you have more than one available capture device in either category, choose the one you want to use for the current capture session.

Capture devices

Video

Pinnacle Studio Deluxe analog

TV Standard: NTSC

Aspect Ratio: 4:3

Audio

Pinnacle Studio Deluxe analog

☐ Use Overlay

☒ Capture preview

Video: The devices listed here may include both digital (DV, MicroMV) equipment connected via an IEEE-1394 cable and various types of analog video source (Studio DC10plus, TV tuner card, USB-connected camera, etc). Your selection determines the availability of some other *Capture source* settings, and of many settings on the *Capture format* panel.

Audio: Your choice of audio devices is constrained by which video device is selected. With most analog devices, for instance, you can choose any of your sound card inputs; your equipment configuration determines which one you should use.

TV standard: Choose the standard that is compatible with your capture device and your TV or video monitor (NTSC or PAL). NTSC is the standard used in North America and Japan. PAL is the standard used in most other places. With some capture devices you may have an additional choice: the SECAM standard used in Russia, France and some other countries. If you purchased your Studio product in North America, the option is permanently set to NTSC.

Use overlay: If you are performing an analog capture with Studio AV/DV, you will have the option of using the “overlay” capability of your graphics hardware when previewing the capture. This may make the preview smoother, but is not supported by all graphics cards. Turn off this option only if it causes problems.

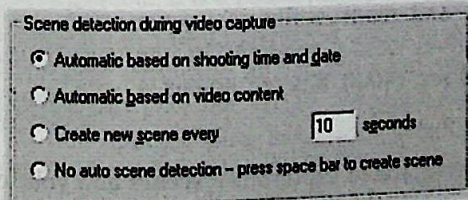
Capture preview: This option controls whether the incoming video will be previewed in the Player during capture. Because generating the preview uses a significant amount of processor time, previewing may cause dropped frames during capture on some systems. Only turn off the option if you are having a problem with dropped frames.

When capturing from a MicroMV camcorder, however, this option is set to *Off* by default and cannot be changed. Preview the source video using your camcorder’s built-in monitor instead.

Aspect ratio: This dropdown list specifies whether the video source for future analog captures should be interpreted as having normal (4:3) or widescreen (16:9) format.

Scene detection during video capture

The effect of these scene detection options is described under “Automatic scene detection” on page 21. The options that are actually available depend on the capture device being used: not all devices support all modes.



The first option, “Automatic scene detection based on shooting time and date”, is available only if you are capturing from a DV source.

Your DV camcorder records not only images and sound, but also the time, date, and various camera exposure settings (see your camcorder manual for more detail). This information is termed *data code*, and is transferred through the IEEE-1394 link along with the video and audio.

Under the default setting, Studio uses the data code information to determine when each new scene begins. It grabs the first frame of each new scene to use as an icon for display in the Album.

Data code does not work if the tape:

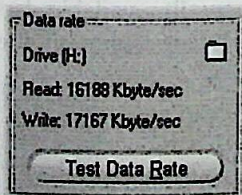
- includes one or more blank (unrecorded) sections
- is unreadable due to tape damage or electronic noise
- was recorded without the camcorder time or date set
- is a copy of another tape
- was shot on an 8mm or Hi8 camcorder, and is now being played back on a Digital8 camcorder.

Under the final option – “No auto scene detection” – a new scene is created each time you press the [Space] key.


Data rate

The DV format uses a fixed 5:1 compression ratio, which implies a data transfer rate for real-time capture of approximately 3.6 megabytes per second (MB/sec). The transfer rate of your capture drive must be at least 4 MB/sec to allow for any variations across the drive.

Test data rate: Click this button to test the data rate of your current capture drive. Studio writes and reads a file of known length, and gives you a read-out of the results in KB/sec (4000 KB/sec equals 4 MB/sec).



If you have attempted to capture DV scenes and your capture drive can't accept the DV data rate, a dialog box will inform you of the problem. You have the options of choosing another drive or adding one that meets the data rate requirement.

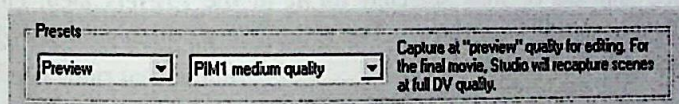
Folder browser: This button  sets the disk directory (and thus the drive) in which your captures will be saved, and lets you specify a default file name for captures. The *Test Data Rate* button will perform its test on the drive where this capture directory is located.

Capture format settings

The options available here depend on the capture device you are using (from the *Capture source* tab). You will not see all the settings described below displayed at once.

Presets

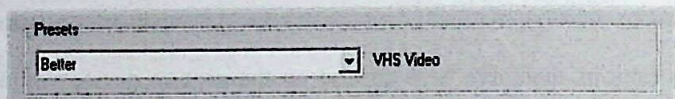
The settings in the other areas on the *Capture format* panel depend on your choice in this *Presets* area. The available presets depend in turn on your capture hardware.



For a DV capture source, the main capture options are selected in the first of two dropdown lists. (The other list provides any applicable sub-options.) The choices are:

- **DV:** Full quality DV capture, which uses about 200 MB of disk space per minute of video. The advantage of this setting is that you won't have to recapture clips at full resolution when you output your finished movie. There are no sub-options with this setting. DV capture is recommended over MPEG if outputting your project to videotape is a possibility.
- **MPEG:** Capturing to MPEG takes less space than DV but more time – both when capturing and later, when you output your movie. The quality presets (High, Medium and Low) are available as sub-options, plus a Custom preset that lets you configure the video settings manually. The best preset to use is the lowest one that meets the requirements of all the devices on which your movie will be played. Use Low if you are outputting only for VCD; Medium if you need to accommodate S-VCD; and High if your movie will be output for DVD.
- **Preview:** Preview-quality dramatically decreases the disk space needed for capturing by lowering the video quality – but only during editing. When outputting your movie, Studio will recapture any preview-quality clips at full quality. Sub-options include several preset combinations of compression method and quality, plus a Custom option that leaves the details up to you.

Other types of capture device provide a single list of quality options – generally Good, Better, Best and Custom.



MicroMV and Studio AV/DV Analog captures both use fixed capture settings with no further options.

Video settings

The settings available in this area depend on both the capture device and the options selected for it in the *Presets* area. Only applicable settings are shown. The settings are editable only if you are using a Custom preset.

List all codecs: By default this checkbox is *not* checked: the only codecs listed are those that have been certified by Pinnacle Systems for use with preview-quality capture. If you check the option, all codecs installed on your PC will be listed.

Using codecs that have not been certified by Pinnacle Systems for use with Studio preview-quality capture may produce undesirable results. Pinnacle Systems cannot provide technical support for problems associated with the use of codecs that are not so certified.

Options: This button gives you access to any setup options offered by the codec (compression/decompression software) you have chosen.

Compression: Use this dropdown list to select the codec you want to use.

Width, Height: These fields control the dimensions of the captured video.

Frame rate: The number of frames per second you wish to capture. The two numerical options represent full-speed and half-speed video respectively. The lower number (14.985 for NTSC, 12.50 for PAL or SECAM) saves disk space at the expense of smoothness.

Quality, Data rate: Some codecs present quality options in terms of a compression percentage (*Quality*), and others in terms of the required data transfer rate in KB/sec (*Data rate*).

MPEG type: Select one of the two flavors of MPEG encoding: MPEG1 or MPEG2. The former is almost universally supported on Windows computers; the latter gives better quality for a given compression ratio.

Resolution: This is a dropdown list giving the resolutions available with the capture options you have picked. Increasing both the width (the first figure) and the height by a factor of two increases the amount of data to be processed by a factor of four.

Pre-filter: This option activates a smoothing algorithm to improve apparent picture quality when capturing at lower resolutions. The sharpness of the image is slightly reduced.

Fast encode: This option speeds up the encoding process with some reduction in quality when capturing to an MPEG file. You may want to evaluate the effect of this option in your production using a short test capture.

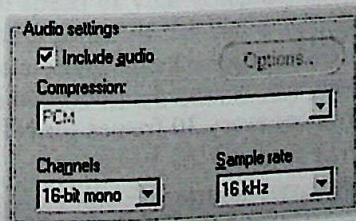
Horizontal resolution: The *Full* option captures more detail; the *Half* option creates every second horizontal pixel by interpolation.

Crop: Activate this option to trim the edges from the incoming video to eliminate “noise” that can occur at the frame borders with some analog sources.

Vertical fields: A video frame consists of two interleaved “fields”. The *Both* option specifies that both fields should be captured; *One* uses only one of the fields, reducing the vertical resolution by half. This mode is useful when creating videos that will be played back on a computer, since computer devices display only one field in any case.

Audio settings

These audio capture settings are editable only if you are using a Custom preset.



Include audio: Clear this checkbox if you are not planning to use the captured audio in your production.

Options: This button gives you access to any setup options offered by the codec (compression/ decompression software) you have chosen.

Compression: This dropdown shows the codec that will be used to compress the incoming audio data.

Channels, Sample rate: These settings control audio quality. "CD quality" is 16-bit stereo, 44.1 kHz.

MPEG capture

This area is visible only when the MPEG preset for capture from DV has been selected.

The three options on the dropdown list control whether MPEG encoding is performed during capture, or as a separate step when capture is complete.

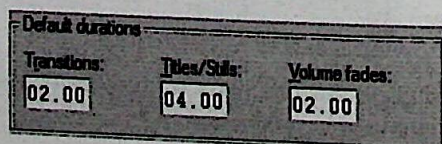
- *Use default encoding mode* lets Studio decide which of the other two choices to use given the speed of your computer.
- *Encode in real time* means that capture and encoding occur in one step. This will produce good results only on a fast enough machine.
- *Encode after capturing* means that encoding will not be performed until the capture itself is complete. This takes longer but is more reliable if you have a slower CPU.

Edit settings

These settings are split into six areas, which are covered in the subtopics below. Hardware settings relating to editing are on the *CD, Voice-over and Surround* panel (see page 207).

Default durations

These duration times are measured in seconds and frames. The seconds counter advances every 30 frames for NTSC, or 25 frames for PAL.



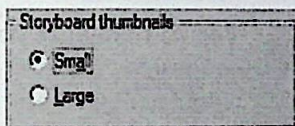
CC-0.Panini Kanya Maha Vidyalaya Collection.

Digitized by Arya Samaj Foundation Chennai and eGangotri

The three settings here control the initial duration value for transitions, still images and volume fades when added to your movie. The durations can be trimmed to custom values during editing. The default values upon installation are as shown in the illustration above.

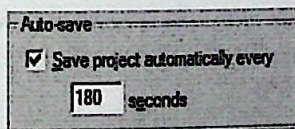
Storyboard thumbnails

Select *Large* to get more detail in the thumbnail frames shown by Storyboard view in the Movie Window. The default is *Small*.



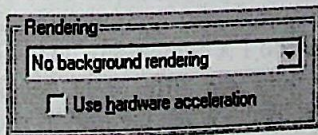
Auto-save

This option, which is turned on by default, configures Studio to save your current project at the specified interval.



Rendering

This area furnishes several options that affect *rendering* – the process in which the video for your final movie is generated from materials you have assembled in the Movie Window.



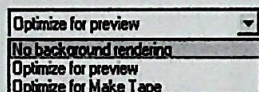
Depending on the speed of your computer system, Studio may be unable to calculate some of its more complex effects rapidly enough to provide a completely smooth and detailed preview in the Player. Among the items which Studio may not be able to generate in real time are:

- Many plug-in video effects;
- Many Hollywood FX 3-D transitions;
- Moving thumbnail frames in disc menus;
- SmartSound background music tracks.

Without special handling, the time needed for Studio to provide previewing for these effects in the Player could hamper your work flow.

Studio gives you two ways of managing this situation:

- **Background rendering:** This feature, which you turn on by choosing either of the *Optimize for* items on the dropdown list, lets the computation of the preview run behind the scenes while you work. Until the rendering is complete, the Player will show the simplified preview described below.



You can optimize background rendering options for preview in the Player or for output to videotape.

The choices involve a trade-off: optimizing for preview will speed up background rendering but slow down the Make Tape step, whereas with *Optimize for make tape* the reverse is true. If you are not planning to output your project to videotape, *Optimize for preview* is always the better choice.

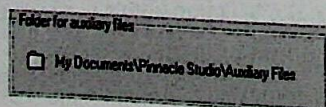
As illustrated under “Moving Thumbnails Checkbox” on page 139, a progress bar in the Timescale reveals the progress of background rendering.

- **Simplified preview:** If you choose *No background rendering*, Studio provides a less detailed preview. For instance, Hollywood FX transitions are shown at lower resolution and a reduced frame rate, while menu thumbnails are shown as static instead of moving.

Use hardware acceleration: Check this option to use the 3-D acceleration capability of your graphics card to speed up the generation of Hollywood FX transitions. Do not use this option if your graphics card does not offer 3-D acceleration, or if you experience display problems when the option is set.

Folder for auxiliary files

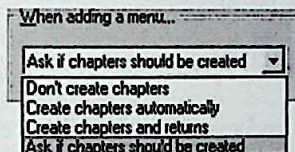
Studio generates auxiliary files in many circumstances as you edit and output your project. These are all stored under the disk folder specified here. Click the *Folder* button to change the auxiliary files’ location – usually because you need to save space on a particular drive.



When adding a menu

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When you place a disc menu on the Timeline, Studio inquires whether you want to generate *chapter links* from the menu to all the clips that follow it (at least until the next menu). The choices on this dropdown list let you avoid the confirmation dialog by specifying that you always don't or always do want the links to be created, or that you want Studio to create links from a new menu to its chapters and also *return links* back to the menu from the end of each chapter. A final option, "Ask if chapters should be created", enables the confirmation dialog, restoring the factory default.



Minimum chapter length: If you have specified that Studio should create chapter links automatically when you add a menu, multiple clips are combined into chapters if necessary to achieve this minimum duration.

CD and voice-over settings

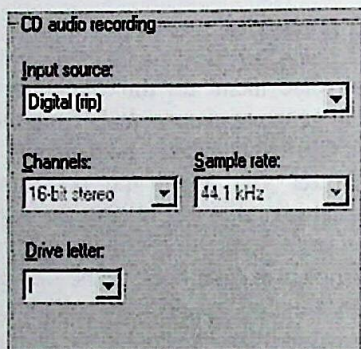
The three areas on this panel provide audio hardware settings relating to editing and preview.

CD audio recording

Input source: This dropdown list lets you choose the method of transferring audio CD data to files on your computer when capturing CD content. The highest-quality transfer is digital – "ripping" the CD tracks.

Channels, Sample rate: These settings control audio quality. "CD quality" is 16-bit stereo, 44.1 kHz.

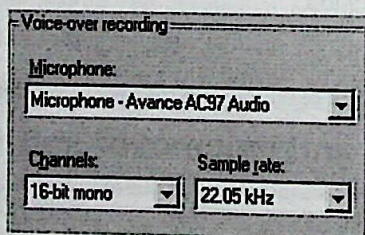
Drive letter: If you have multiple CD drives, choose one to use as the CD audio source for your movies.



Voice-over recording

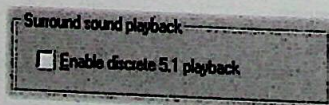
Microphone: A dropdown list of choices for attaching a microphone to your hardware.

Channels, Sample rate: These settings control audio quality. A typical setting for voice-overs is 16-bit mono at 22.05 kHz.



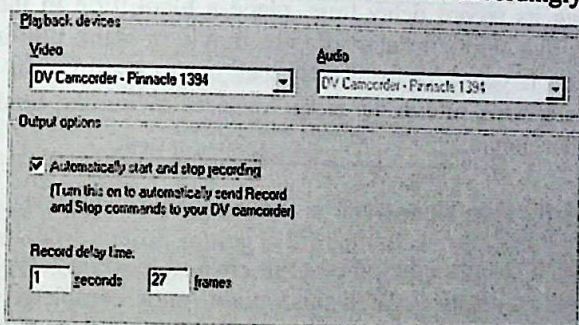
Surround-sound playback

Enable discrete 5.1 playback: Check this box if the desktop audio system you use when previewing your Studio project supports discrete 5.1 audio. Leave it unchecked if you are previewing in surround-sound with a Pro Logic compatible system, or in stereo..



Make tape settings

Studio automatically senses the hardware you have installed, and configures the Make Tape playback destination accordingly.



If you are *printing* (making tape) to a DV device, you can choose to have Studio start and stop the device automatically instead of having to do it yourself.

To control printing automatically:

1. Click the *Make Movie* button on the main menu bar.
The upper half of the screen changes to display the Make Movie window.
2. Click the *Tape* tab.
3. Click the *Settings* button. The *Make tape* options panel opens.
4. Check the *Automatically start and stop recording* box to enable the automatic function.

With most DV devices there is a small delay between receiving the command to record and the actual start of recording. In Studio, this is referred to as the "record delay time". It varies from device to device, so you may need to experiment with the value for best results with your particular device.

5. Click *OK*.
6. Click *Create*.

Studio renders your movie, then sends the *record* command to your DV device. Studio outputs the first frame of your movie (without audio) for the duration entered for record delay time, giving the device time to bring the tape up to speed and begin recording.

Hint: When you play back your tape, if the first part of your movie was not recorded, you should increase the *Record delay time* setting. On the other hand, if your movie begins by holding onto the first frame as though it were a still photograph, you should decrease the setting.

Hint: If you wish to send black to your recording device during its record delay time, place a blank title in the *video* track just before the start of your movie (a blank title is video black). If you wish to record black at the end of your movie, place a blank title in the *video* track following the final frame of your movie.

Output to the screen

One of the options on the *Video* dropdown in the *Playback devices* area is "VGA display". With this option, your completed project will be played back onto your monitor screen rather than to an external device.

Make AVI file settings

The *Make AVI file* options panel lets you adjust compression settings, whether to minimize the size of the output file, to increase its quality, or to prepare it for a special purpose (such as distribution via the Internet) where there may be requirements involving characteristics such as frame size.

The screenshot shows a dialog box titled "Make AVI file" with two main sections: "Video settings" and "Audio settings".

Video settings:

- ☒ Include video in AVI file
- ☐ List all codecs
- Compression: DV Video Encoder (selected from a dropdown menu)
- Width: 720, Height: 480, Frames/second: 29.97 (all in dropdown menus)
- Quality: ☐ Quality, ☒ Quantize
- A slider bar for quality/quantization, currently set to a low value.
- Kbytes/sec: (empty box)

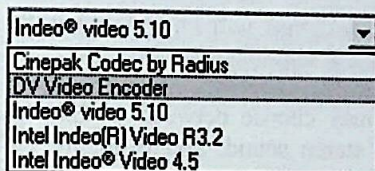
Audio settings:

- ☒ Include audio in AVI file
- ☐ List all codecs
- Type: PCM (selected from a dropdown menu)
- Channels: 16-bit stereo (selected from a dropdown menu)
- Sample rate: 48 kHz (selected from a dropdown menu)
- Force settings to be same as current project: ☐
- Same as Project (button)

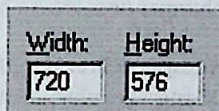
Video settings

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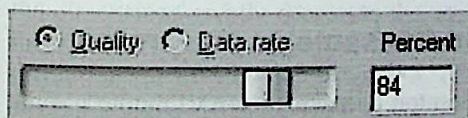
Compression: Choose the compressor (codec) that is most suitable for your intended use. When making an AVI file, you'll want to choose your compression settings for the capabilities of, and codecs supported by, the intended viewer's computer platform.



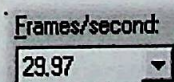
Width, Height: The frame size is measured in pixels. The default setting is the resolution at which Studio captures. Decreasing the width and height greatly decreases file size, although compression moderates this effect.



Quality, data rate: Depending on the codec being used, you can adjust the quality percentage or data rate with the slider. The higher the percentage or rate you choose, the larger the resulting file.



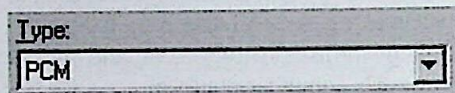
Frames/second: The default value is 29.97 frames per second for NTSC video, or 25 frames per second for PAL. You may want to set the frame rate lower for applications such as Web video. Most Pentium-based computers can play 352 x 240 at 15 frames per second smoothly. Higher performance PCs will be able to play back video with larger frame sizes and higher frame rates smoothly.



Audio compression settings

Audio settings: If you want to keep file sizes to a minimum, audio for many digital uses can be set to 8-bit mono at 11 kHz. As a rule of thumb, try 8-bit 11 kHz for audio that is mostly speech, and 16-bit stereo at 22 or 44 kHz for audio that is predominantly music. By comparison, CD-ROM music is 16-bit stereo sampled at 44 kHz. Another convenient rule of thumb for audio compression is that

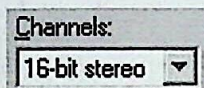
11 kHz is roughly equivalent to AM radio quality. 22 kHz equates to FM radio quality, and 16-bit stereo, 44 kHz to audio CD quality.



A screenshot of a software interface showing a dropdown menu labeled 'Type:'. The menu is open, and 'PCM' is selected. There is a small downward arrow icon to the right of the text.

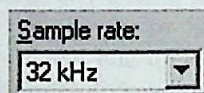
Type: In most cases, you will choose either PCM (Pulse Code Modulation) or ADPCM (Adaptive Delta PCM).

Channels: You may choose between 8- and 16-bit mono and stereo sound. Sound quality and file size increases when you add a second channel or increase bit depth.



A screenshot of a software interface showing a dropdown menu labeled 'Channels:'. The menu is open, and '16-bit stereo' is selected. There is a small downward arrow icon to the right of the text.

Sample rate: Digital audio is produced by taking regular instantaneous samples of the continuous analog waveform. The more samples, the better the sound. For example, audio CDs are recorded at 44 kHz, 16-bit stereo. Audio can be sampled at frequencies as low as 11 kHz for many digital uses, particularly for speech.



A screenshot of a software interface showing a dropdown menu labeled 'Sample rate:'. The menu is open, and '32 kHz' is selected. There is a small downward arrow icon to the right of the text.

Force settings to be the same as the project

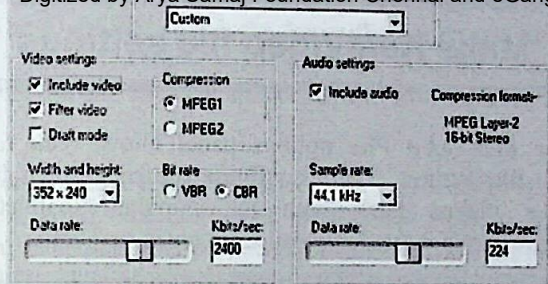
Click the *Same as project* button to make your AVI output use the same format as the highest resolution clip in your current project.

Make MPEG file settings

The *Make MPEG File* options panel allows you to adjust MPEG compression settings.

Presets are provided You can choose presets for a variety of applications. There are presets for Internet playback, PC and multimedia playback, and for writing VideoCD (VCD), S-VCD and DVD files.

The Custom preset allows you to exclude the source audio or video, and to independently vary your audio and video data rates.



Video settings

Compression: You can choose either MPEG-1 or MPEG-2 compression. MPEG-2 offers higher resolution and higher quality than MPEG-1.

Note: MPEG-2 files require special decoder software. If you do not have an MPEG-2 decoder installed on your PC you will not be able to play MPEG-2 files.

Width, Height: The frame size is measured in pixels. Decreasing the dimensions greatly decreases the amount of data, and therefore the file size, but compression reduces the effect. The maximum resolution for MPEG-1 is 384 x 288. The maximum resolution for MPEG-2 video is 720 x 576.

Bit rate: Choose whether to create the MPEG file with VBR (variable bit rate) or CBR (constant bit rate) encoding. The VBR option uses less storage at a given quality level than CBR, but may cause problems when the file is viewed using some DVD players. If you observe jerky or stuttering playback, use CBR.

Data rate: You can adjust the data rates for audio and video separately by using the sliders. Higher data rates yield higher quality, at the cost of larger files.

Audio settings

Sample rate: Digital audio is produced by taking discrete samples of a continuous analog waveform – the more samples, the better the sound. MPEG supports two sample rates, 44.1 kHz and 48 kHz.

Data rate: You can adjust the data rates for audio and video separately using the sliders. Higher data rates yield higher quality at the cost of larger files.

Make RealVideo file settings

The *Make RealVideo File* options panel allows you to adjust RealVideo file settings. These configure the creation of files that are to be played back with the popular RealNetworks® RealPlayer®, free for the download from www.real.com.

Title: Leave it to Thorkey	Author: Thorkey Grinmarket	Target audience <input checked="" type="checkbox"/> Dial-up Modem <input type="checkbox"/> Single ISDN <input type="checkbox"/> Dual ISDN <input type="checkbox"/> Corporate LAN <input type="checkbox"/> 256K DSL/Cable <input type="checkbox"/> 384K DSL/Cable <input type="checkbox"/> 512K DSL/Cable
Copyright: © TG Productions Inc.	Keywords: comedy, trumpet, deep sea fishing	
Video Quality: Normal Motion Video	Audio Quality: Voice with Background Music	
Video size <input type="radio"/> 160 x 120 <input checked="" type="radio"/> 240 x 180 <input type="radio"/> 320 x 240	Web server <input checked="" type="radio"/> RealServer <input type="radio"/> HTTP	

Title, Author, Copyright: These three fields are used to identify each RealVideo movie, and are encoded into it so that they are not visible to the casual viewer.

Keywords: This field accepts up to 256 characters, and allows you to encode keywords into each movie. It is typically used to identify the movie for Internet search engines.

Web server: The *RealServer* option allows you to create a file that can be streamed from a RealNetworks RealServer. The RealServer supports a special feature that senses the connect speed of the viewer's modem, and adjusts its transmission rate to suit. The option allows you to select up to seven *Target audience* data rates. Because the file size, and your upload time, increase with each data rate you add, select only those target audiences you think are actually needed.

To make use of the *RealServer* option, the ISP hosting your website must have the RealServer software installed. If you are unsure, contact your ISP for confirmation, or use the standard *HTTP* option, which allows you to optimize playback for exactly one of the six *Target audience* options listed.

Note: GeoCities provides RealServers to their "homesteaders".

Target audience: This selects the target audience modem connect speed. The lower the speed, the lower the quality of the video. If you wish your viewers to be able to view your movie as it loads, you should select a target audience rate that their modems can handle.

When you select a target audience, you are actually specifying a maximum bandwidth for your RealMedia stream. Bandwidth, measured in kilobits per second (Kbps), is the amount of data that can be sent through an Internet or network connection in a given time span. Standard modems (those that use ordinary telephone lines) are classified by the bandwidth they are able to process. Common values are 28.8 and 56 Kbps.

In addition to these standard audiences, you can record clips for connection speeds of 100 Kbps, 200 Kbps, or higher. These higher bandwidths are suitable for audiences that use corporate Local Area Networks (LANs), cable modems or Digital Subscriber Line (DSL) modems.

If you want to keep file sizes to a minimum, audio for many digital uses can be set to 8-bit mono at 11 KHz. As a rule of thumb, try 8-bit 11 KHz for audio that is mostly speech, and 16-bit stereo at 22 or 44.1 KHz for audio that is predominantly music. For comparison, CD-ROM music is 16-bit stereo sampled at 44.1 KHz.

Video quality: These choices let you balance the rival requirements of image quality and frame rate.

- **No video:** When this selection is made, the output file will contain audio only.
- **Normal motion video:** Recommended for mixed content clips to balance video motion and image clarity.
- **Smoothest motion video:** Recommended for clips that contain limited action, such as newscasts or interviews, to enhance overall video motion.
- **Sharpest image video:** Recommended for high-action clips to enhance overall image clarity.
- **Slide show:** The video appears as a series of still photos, providing the best overall image clarity.

Audio quality: This dropdown menu lets you choose the characteristics of your audio track. Studio uses this information to

select the best audio compression for your RealVideo file. Each successive option provides better audio quality but a larger resulting file.

- **No audio:** When this selection is made, the output file will contain video only.
- **Voice only:** This option provides adequate quality for spoken audio in clips without music.
- **Voice with background music:** This option is designed for situations where, even though background music may be present, the spoken audio predominates.
- **Music:** Use this option for a monaural track in which music is prominently featured.
- **Stereo music:** Use this option for a stereo music track.

Video size: These choices allow you to automatically resize your movie. The smaller the resolution, the lower the data rate your viewers need to handle.

Make Windows Media file settings

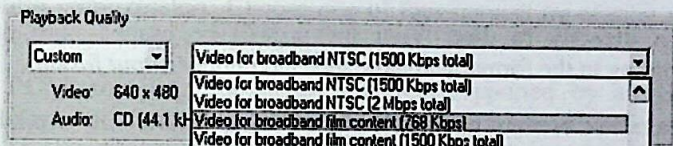
The *Make Windows Media File* panel lets you adjust options for creating Windows Media Player files.

Title: Thorkey's Birds
Author: Thorkey Guitmarket
Copyright: © TG Productions Inc.
Description: The unearthly beauty of Thorkey's backyard bird sanctuary.
Rating: G
Markers for Media Player "Go To Bar"
☒ No markers
☐ Markers for every clip
☐ Markers for named clips only
Playback Quality
Low
Small Size Video (VBR), Half Frame Rate, Mono Audio (CBR)
Video: 160 x 120
Audio: FM radio (16 kHz)

Title, Author, Copyright: These three fields are used to identify each Windows Media movie, and are encoded into it so they are not visible to the casual viewer.

Description: This 256-character field lets you enter keywords for encoding into the movie. It is typically used to identify the movie for Internet search engines.

Playback quality: Choose the playback quality of your movie based on the capability of the target platform – the computer(s) that will play the movie. The exact audio and video parameters corresponding to the current choice are displayed in the space below the list. The *Custom* option lets you fine-tune the settings by selecting from a list of possible combinations.

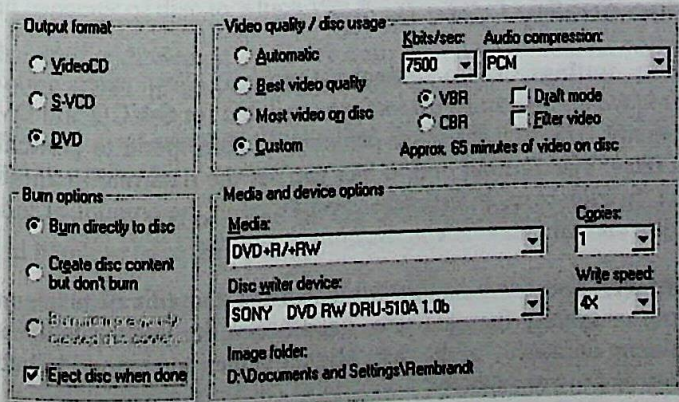


Markers for Media Player “Go To” bar: You have the option of including Windows Media “file markers” as you compress. These markers allow viewers to go directly to the beginning of any clip. The markers are listed by clip name. Clips you have not named get a Studio default clip name derived from the Project Name and the clip’s original timecode start point.

Make disc settings

The *Make Disc* options allow you to adjust options for creating VCD, S-VCD or DVD discs, and for creating a DVD disc image on a hard drive.

To create a VCD or S-VCD requires a CD or DVD burner; to create a DVD requires a DVD burner.



Output format

Select VideoCD (VCD), S-VCD or DVD. Options in other areas of the panel are dependent on this choice.

Burn options

Burn directly to disc: Your movie will be burned onto disc according to the format you have selected under *Output format*.

Create disc content but don't burn: This choice is only available when the output format is DVD. Your disc burner is not used. Instead, the same files that would normally be saved onto a DVD disc are stored into an "image folder" on a hard drive. The location of that folder is shown in the *Media and device options* area (see page 219).

Burn from previously created disc content: This choice is only available when the output format is DVD. Instead of using your current project directly to burn a disc, a previously-created disc image is now sent to your DVD burner. This lets you divide the work of creating a disc into two separate steps that can be performed in separate sessions if desired. It is particularly useful when you want to make several copies of the same project. Although the project is not used directly in making the disc, it must nevertheless be open in Studio when the disc is burned.

Eject disc when done: Check this box if you would like Studio to automatically eject the disc after the burn process has been completed.

Video quality / disc usage

Quality settings: These settings (*Automatic*, *Best video quality*, *Most video on disc* and *Custom*) are available for S-VCD and DVD discs only. The first three are presets that correspond to particular data rates. The *Custom* option lets you set the data rate to another value. In each case, an estimate is provided of the amount of video the disc can accommodate at the current setting.

Kbits/sec: This combination dropdown list and edit field lets you choose or specify the data rate – and hence the video quality and maximum duration – of the disc. Higher values correspond to better quality and lower capacity.

Filter video: This option enables a smoothing filter that may improve the apparent quality of video at lower data rates. Image sharpness is slightly reduced.

Draft mode: This option speeds up the MPEG encoding process at the expense of some reduction in quality.

Audio compression: Choose one of four options for storing your movie's soundtrack to DVD:

- **PCM** encoding for stereo sound is supported by all DVD players, but takes up more space on the DVD than MPEG.
- **MPEG** audio support is always provided on PAL players. On NTSC players it is broadly supported, but theoretically optional.
- **Dolby Digital 2-channel** encoding can be used to compactly store either a stereo or a surround soundtrack. To hear the surround mix requires equipment with Dolby Pro Logic compatibility. On other systems, it will be heard as a normal stereo mix.
- **Dolby Digital 5.1-channel** encoding stores the surround channels discretely. To hear the surround mix on playback requires a surround amplifier and speaker system.

VBR/CBR: Choose whether to write the MPEG data to the disc using VBR (variable bit rate) or CBR (constant bit rate) encoding. The VBR option uses less storage at a given quality level than CBR, but may cause problems when the file is viewed using some DVD players. If you observe jerky or stuttering playback, use CBR.

Media and device options

Media: Choose an entry from this dropdown list matching the type and capacity of disc to which you are burning your project.

Disc writer device: If you have more than one disc burner on your system, select the one you want Studio to use.

Copies: Select or enter the number of copies of this disc that you want to create.

Write speed: Choose one of the available speeds, or leave this field blank to have the speed auto-selected.

Image folder: The location of the DVD image folder that will be used for the *Burn options / Burn from disc image* setting.

APPENDIX B:

Tips and tricks

Here are some hints from Pinnacle technical specialists on choosing, using and maintaining a computer system with video in mind.

Hardware

To use Studio effectively, your hardware should be optimally prepared and configured.

It is recommended that you use UDMA IDE drives as they provide reliable video transfer performance with Studio. We highly recommend you capture to a hard drive other than the one upon which Windows and the Studio software are installed.

Since recording video sequences in the DV format requires a data transfer rate of approximately 3.6 MB per second, your hard drive should maintain a performance level of at least 4 MB/s. Higher transfer rates will ensure reliability and help avoid problems with output to tape.

You can calculate the amount of hard drive space you'll need for your video using the 3.6 MB/sec value.

For example:

1 hour of video = 3600 seconds (60 x 60)

3600 seconds x 3.6 MB/s = 12,960 MB

Hence 1 hour of video uses 12.9 GB of storage.

Due to their automatic internal calibration, standard hard drives regularly interrupt the continuous data stream in order to recalibrate

themselves. During capture, this is not apparent since images are temporarily stored in memory. But during playback, only a limited number of images can be temporarily stored in this manner.

For smooth playback, a continuous, uninterrupted data stream is required. If not, the image will “jerk” at regular intervals, even though all frames are present and even if the hard drive is very fast.

Preparing your hard drive

Prior to capturing video, you should:

- Close background applications. Before opening your Studio product, hold down the Ctrl and Alt keys on the keyboard, then hit Dele~~t~~e. This will open the Close Program window. Click on the individual applications listed in the Close Program window and click the *End Task* button. Do this for all applications listed in the Close Program *except* Explorer and SysTray. Software utilities are available for Windows 2000 and XP that can assist with this procedure.

- Click on *Start > Programs > Accessories > System Tools > ScanDisk*

Make sure *Thorough* is checked, and click *Start* (this may take a while).

- After ScanDisk is done, click on *Start > Programs > Accessories > System Tools > Disk Defragmenter* (this may take a while).
- Turn off energy-saving features. Point your mouse on your Desktop, right-click, and select *Properties > Screensaver* (under *Energy... Settings*). Make sure everything under *Settings for... power schemes* is set to *Never*.

Note: Video-editing programs do not multitask very well. Do not use any other program while making movie (videotape or CD) or capturing. You *can* multitask while editing.

RAM

The more RAM you have, the easier it is to work with Studio. You will need at least 256 MB of RAM to work with the Studio application, and we highly recommend 512 MB (or more).

Motherboard

Intel Pentium or AMD Athlon 800 MHz or higher.

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Software

Color depth adjustment

1. 16-bit color depth is recommended.
2. Position your mouse over your Desktop, right click, and select *Properties > Settings*.
3. Under Colors, choose High Color (16-bit).

The overlay settings affect only the display on the computer monitor, while recorded sequences will always appear in full color and resolution at the video output.

Windows 98 Second Edition

To improve system performance under Windows 98SE, you can make the following modifications.

Hard drive settings:

1. Go to Start > Settings > Control Panel > System. Click on the Performance tab, then File System, then the Troubleshooting tab.
2. Click to the left of *Disable write-behind caching for all drives* option to select it and click *OK*.
3. Under the *Hard-disk* tab, set the *Read-ahead optimization* option to *None*.
4. Ensure that DMA is enabled for your hard drive.

CD-ROM drive setting:

Under Windows 98, you can specify automatic notification for a CD-ROM.

1. Select Start > Settings > Control Panel > System > Device Manager.
2. Click on *CD-ROM*.
3. Click on your CD-ROM drive name.
4. Select *Settings > Options*.

5. **Deactivate *Auto insert notification*.**

Do not operate an enhanced IDE CD-ROM drive in parallel with an enhanced IDE hard drive. This combination can lead to an unnecessary reduction in the speed of your hard drive. Instead, use the second IDE interface for your CD-ROM drive.

Taskbar:

Switch the clock on the taskbar off.

1. Right-click the mouse on the taskbar.
2. Select *Properties*.
3. Deactivate the *Show Clock* option.

Increasing the frame rate

If your system is unable to achieve an adequate frame rate (25 fps for PAL/SECAM, 29.97 fps for NTSC), try the following:

Deactivate network driver and applications

Network operations often cause interruptions during recording and playback. We recommend not working in a network.

Audio recording

Record audio only when you actually need it, because sound requires a great deal of processor time during video recording. We recommend a PCI soundboard.

Digital video with audio

When recording digital video sequences with audio, remember that the audio also takes up hard drive space:

- CD quality (44 kHz, 16-bit, stereo) requires about 172 KB/sec.;
- Stereo quality (22 kHz, 16-bit, stereo) about 86 KB/sec., and
- Mono quality (22 kHz, 8-bit, mono) still requires 22 KB/sec.

The better the sound quality, the more space is consumed. The highest quality (CD) is rarely required. However, the lowest quality (11 kHz/8-bit, mono) rarely provides acceptable audio sequences.

Studio and computer animation

If you are editing computer animation with Studio or wish to combine animation with digital video, remember to create your animations using the same frame size and image refresh rate as your original video:

Quality	TV-Cropping	PAL	NTSC	Audio
DV	Yes	720 x 576	720 x 480	44 kHz 16-bit stereo

Failure to do this will result in unnecessarily long rendering times and the possibility of visible flaws when the animation is played back.

Smart Capture Tips (DV only)

SmartCapture relies on continuous, uninterrupted timecode to recapture your clips. If your original tapes have multiple sections of discontinuous timecode, each section was captured as a separate file. Before it can recapture your clips, Studio will prompt you to cue the tape to the section where that clip is recorded.

To help you recognize the correct section of tape, the Preview window will display an image of the first frame of the clip. When you have cued to the correct section, Studio will recapture all required clips from the section. If you have followed the naming convention suggested on page 23, Studio will proceed to the next section of tape and repeat the process until all required clips from that source tape have been recaptured. Not following the naming convention results in changing source tapes much more often.

When Studio recaptures your clips, it will capture about a second of extra footage at the start and end of your clip. Studio automatically trims each clip to match the exact start and end points you chose for your movie, but this extra captured footage allows you to adjust start and end points of each clip if you happen to change your mind after recapturing. You can do this either on the Timeline or with the *Clip properties* tool.

Starting with continuous timecode

To avoid the multiple captures problem altogether, we recommend stripping your tapes with timecode before you begin to shoot, if possible (see "Continuous timecode" on page 23).

APPENDIX C:

Troubleshooting

Before you begin troubleshooting, take some time to check your hardware and software installation.

Update your software: We recommend installing the latest operating system updates for Windows 98, ME, 2000 or XP. You can download these updates from:

windowsupdate.microsoft.com/default.htm

Make sure you have the latest version of the Studio software installed by clicking the *Help > Software Updates* menu from within the program. Studio will use the Internet to check for possible updates.

Check your hardware: Ensure that all installed hardware is functioning normally with the latest drivers, and is not flagged as having a problem in the Windows Device Manager (see below). If any devices are flagged you should resolve the issue before starting installation.

Get the latest drivers: We also highly recommend installing the latest drivers for your sound card and graphics card. During the Studio software launch process we do verify that your sound card and video card support DirectX.

Go to the manufacturers' web-sites to get the latest drivers for your sound and graphics cards. Many users have NVIDIA or ATI graphics cards, for which the latest drivers are available at:

www.nvidia.com and www.atitech.com

Those with Sound Blaster audio cards can get updates here:

us.creative.com

Opening Device Manager

The Windows Device Manager, which lets you configure your system's hardware, has an important role in troubleshooting.

The first step in accessing Device Manager under all versions of Windows is right-clicking on *My Computer* then selecting *Properties* from the context menu. This opens the System Properties dialog. With Windows 98 or Millennium, simply select the dialog's *Device Manager* tab. With Windows 2000 or XP, click the *Device Manager* button on the *Hardware* tab.



TECHNICAL HELP ON-LINE

The Pinnacle Support Knowledge Base is a searchable archive of thousands of regularly-updated articles about the most common questions and issues users have regarding Studio and other Pinnacle products. Use the knowledge base to find answers to any questions you may have about installing, using or troubleshooting Pinnacle Studio.

Access the knowledge base with your web browser by visiting:

<http://pinnacle.custhelp.com>

The knowledge base home page will appear. You don't have to register to browse the knowledge base, but if you want to send a specific question to technical support staff you will need to create a knowledge base account. Please read any knowledge base articles relevant to your inquiry before contacting technical support.

Using the knowledge base

In the *Product* dropdown, select "Studio Version 9". If appropriate, you can also select a *Sub-Product*, a *Category*, or both. Selecting a sub-product or category may reduce the number of irrelevant hits you will get from your search, but may also eliminate helpful articles of a more general nature. If you're not sure what category to pick, leave the selection at *All Categories*.

To search for an article, type a short phrase or group of keywords in the text box. Don't get too wordy; the search works best when given just a few words.

Search example

In the list below of common troubleshooting issues, the first item is, "Studio crashes or hangs in Edit mode".

Type "Crash in edit mode" in the search box and click the *Search* button. You should get back somewhere between 60 and 150 hits. The very first one, "Studio crashes in Edit", lists the known causes for this issue and their remedies.

If you search instead on the single keyword "Crash", you will get far fewer hits, all relating to crashes in Studio.

If one search does not turn up an article that seems relevant to your problem, try modifying the search by choosing a different set of keywords. You can also use the *Search by* and *Sort by* options to select for specific or popular articles.

Searching by Answer ID

If you know the Answer ID number of the answer you're looking for, you can access the item directly. For example, if you are getting a capture error when you press the *Capture* button, someone might refer you to knowledge base article 2687, "I am getting a capture error with Studio". In the *Search by* dropdown, select "Answer ID", enter the ID number in the text box, and click *Search*.

Top knowledge-base search issues

1. Studio crashes in Edit mode (ID 6786).
2. Capture error appears when attempting to start capture (ID 2687).
3. Studio hangs when rendering (ID 6386).
4. CD or DVD burner is not detected (ID 1593).
5. Studio hangs on launch or does not launch (ID 1596).
6. HollywoodFX transitions are still watermarked after upgrading (ID 1804).
7. "Cannot initialize the DV capture device" error appears in Capture mode (ID 2716).

The information on the following pages is based on these often-viewed knowledge base articles.

Studio crashes in Edit mode

Answer ID 6786

If Studio is crashing, the cause is most likely either a configuration issue or a problem with a project or content file. This type of issue can often be fixed with one of the following methods:

- Uninstalling and reinstalling Studio.
- Optimizing the computer.
- Rebuilding a corrupt project.
- Recapturing a corrupt clip.

To help troubleshoot the problem, determine which of the failure modes listed below best matches the symptoms you are experiencing, then refer to the corresponding set of instructions:

- **Case 1:** Studio crashes randomly. There doesn't seem to be any one thing that will cause the crash, but crashes happen frequently.
- **Case 2:** Studio crashes every time you click on some particular tab or button within Edit mode.
- **Case 3:** Studio crashes each time you carry out some specific sequence of steps.

Case 1: Studio crashes randomly

Try each of the following solutions in turn:

Get the latest version of Studio: Make sure that you have the latest version of Studio 9 installed. The latest version can be found on our website at:

www.pinnaclesys.com/support/studio9

Be sure to close all other programs before installing a new version.

Adjust Studio settings: Choose *No background rendering* in the *Rendering* dropdown list, and clear the *Use hardware acceleration* checkbox. Both options are found on the *Edit options panel* (see page 204).

End background tasks: Close other applications and unload any background processes before using Studio.

- In Windows 98 and Windows Millennium, manage background processes by pressing Ctrl+Alt+Delete to open the Task Manager. Close all the items on the list except Systray and Explorer.
- Under Windows 2000 and Windows XP, press Ctrl+Alt+Delete to open the Task Manager. You probably won't see much under the *Applications* tab, but the *Processes* tab will show you the software that is currently running. Since it can be difficult to be sure which processes should not be closed, software utilities are available for Windows 2000 and XP that can assist with this procedure.

Defragment your hard drive: Over time, the files on your hard drive can become *fragmented* (stored in multiple parts in different areas of the drive), which slows down access and may lead to performance problems. Use a disk defragmenter utility like the one supplied with Windows to prevent or correct this problem. Access the built-in defragmenter with the *Disk defragmenter* command on your *Programs > Accessories > System tools* menu.

Update audio and video drivers: Make sure that you have obtained the latest drivers for your sound and video cards from their manufacturers' web-sites. You can see what sound and video cards you have in the Windows Device Manager.

To determine what video card you have, click the plus sign in front of *Display Adapters* in the Device Manager list. The name of your video card is now displayed. Double-clicking the name opens another dialog, where you choose the *Driver* tab. Now you can view information about the driver's manufacturer, and the names of the driver's constituent files.

The sound card is displayed in the *Sound, video and game controllers* section of Device Manager. Again, double-clicking the name lets you access the driver details.

Update Windows: Make sure you have all the latest Windows updates that are available.

“Adjust for best performance”: Use this system option to turn off visual extras in Windows 2000 and Windows XP that consume additional CPU time. Right-click *My Computer*, select *Properties* from the context menu, then click on the *Advanced* tab. Under *Performance*, click the *Settings* button to open the Performance Options dialog. Select the *Adjust for best performance* option and click *OK*.

Update DirectX: Update to the latest version of DirectX. You can download it from Microsoft here:

www.microsoft.com/windows/directx

Open up space on your boot drive: Make sure you have 10 GB or more free space on your boot drive for paging.

Uninstall, reinstall and update Studio: In case your Studio installation has become corrupted, try this procedure:

1. **Uninstall Studio:** Click on *Start > Programs > Studio 9 > Uninstall Studio 9*, then follow any on-screen instructions until the process is complete. If the uninstaller asks whether you want to delete a shared files, click *Yes to all*. Disconnect the camera and cable from your DV board, if you have one.
2. **Reinstall Studio:** Insert your Studio CD and reinstall the software. Make sure you are logged in as the Administrator (or as a user with Admin privileges) when installing Studio. It is strongly recommended that Studio be installed in its default directory on the main OS drive.
3. **Download and install the latest version of Studio:** Click the *Help > Software Updates* menu command to check for updates. If a new version of Studio is detected on our web-site, you will be asked to download it. Download this *patch file* to a location where you can find it easily (such as the Desktop), then exit Studio. Finally, double-click the downloaded file to update Studio.

Rebuild corrupt project: Try rebuilding the first few minutes of your project. If no problems occur, gradually add to the project, checking periodically to ensure that system stability is maintained.

Fix corrupt video or audio: Sometimes the instability may occur only when you manipulate certain audio or video clips. In such

cases, you should recapture the audio or video. If the audio or video was created by another application, recapture it with Studio if possible. While Studio supports many video formats, the particular clip you have may be corrupt or in an uncommon format. If you have a wav or mp3 file that seems to be problematic, convert the file to the other format before importing the file. Many wav and mp3 files on the Internet are corrupt or non-standard..

Reinstall Windows: This is quite a drastic step, but if the previous steps have not helped, Windows itself may be corrupt. Even though your other applications may appear to be running properly, the size of the video files used in Studio may well tax your system to the point that a latent instability is revealed.

Case 2: Clicking a tab or button crashes Studio

Please start by trying the steps given above for Case 1. This kind of problem often means that Studio was not installed properly or has become corrupt. Uninstalling Studio, reinstalling it, and patching to the latest version will generally solve the difficulty.

Otherwise, try creating a new project called "test01.stu" to try to determine if the failure is specific to a particular project. Open the demo video file and drag the first few scenes onto the Timeline. Now click on the tab or button that seems to cause the failure. If this test project does not crash, it may be that the problem is with the project you are working on rather than with Studio or your system. If the test project does fail, please contact our support staff and provide us with the details on the exact failure mode. We will try to recreate and solve the problem.

Case 3: Performing certain steps crashes Studio

This is just a more complicated version of Case 2, and the same troubleshooting steps apply. Since it may be quite difficult to determine the exact sequence of steps that produces the failure, you will need to be methodical in your approach. Creating a small test project, as described for Case 2, helps eliminate variables that may confuse your test results.

Capture error occurs on starting capture

Answer ID 2687

Some problems can be traced to incompatibilities or issues with particular third-party capture cards:

- **ATI:** Studio should work with most All In Wonder cards.
- **Hauppauge:** Please see the FAQ on our web site for information regarding Hauppauge cards.
- **Dazzle:** The Dazzle DVC 80, DVC 150 and Fusion are supported. Please the FAQ on our web site for a complete list of supported Dazzle hardware.

Troubleshooting steps

The initial goal, before you capture, is to see video playing in the preview window.

1. Check capture source settings in Studio. Since you may have more than one capture device in your system (1394 cards, TV tuners, webcams, etc.) you must be sure to select the correct capture source. In Studio's Capture Mode, click the *Settings* button, then click the *Capture Source* tab on the Setup Options dialog. Select your video capture device on the *Video* dropdown list.

If the option for your desired capture device is not listed then go to the Windows Device Manager. If the capture driver for your capture device is flagged or not listed, reload the capture driver as follows:

- **Pinnacle drivers:** Use the CD to locate and install the Pinnacle drivers for the card you have installed.
 - **Third party drivers:** Use the CD that came with the capture device or call the manufacturer (or visit their web-site) for the most current driver.
2. If you are capturing from an analog source, make sure the correct analog type is selected. In the Diskometer window (in Studio's Capture mode), click the left tab to open the fly-out

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panel of analog video settings. Select *Composite* or *S-Video* as needed.

If the correct item is already selected, select the other one, then toggle back to the correct one after a few seconds. This can help reset Capture mode to properly detect the input signal.

3. If you are capturing from an analog source, check your cabling. The cabling should match the *Composite* or *S-Video* setting you selected above. If possible, try a different cable, tape and VCR to see if the problem can be traced to one of those components.
4. Make sure the player heads are clean, and that the tape is in good condition. Make sure all physical connections are secure.
5. If you are capturing from an analog source, you will need to press the *play* button on the source deck before capturing – there are no on-screen controls. If your player is not playing when you click the *Capture* button, you will get a Capture Error.

If you continue to get a Capture Error after trying the above steps, please test your setup with the AMCAP capture application. AMCAP is a generic application used to test device compatibility. If you can't capture with AMCAP, your capture card probably doesn't have the right driver for your version of Windows.

To use AMCAP:

1. Click Start > Programs > Studio 9 > Tools > Am Capture.
2. In the AMCAP window, select your capture device on the *Devices* menu.
3. Clicking the *Options* > *Preview* menu command should show video in the AMCAP window if the cabling is correct and the source (camcorder, VCR, etc.) is turned on. To capture, click on the *Capture* menu and select *Start Capture*. There may be some selections for setting up your capture card.

Note: AMCAP will not work with capture devices that have hardware MPEG encoders (e.g., MovieBox USB, PCTV Deluxe, MP20, and the TDK Indi device).

In the unlikely event that you cannot capture in Studio with your capture card even after all troubleshooting steps have been tried, you can work around the problem by capturing outside of Studio then importing the captured video into Studio for editing and output.

Studio hangs when rendering

Answer ID 6386

With this type of problem, Studio “gets stuck” during rendering (preparing your video for output in Make Movie mode). To identify the solution in a particular case, try the troubleshooting steps for whichever of the following failure modes best matches your situation:

- **Case 1:** Rendering stops immediately after it starts.
- **Case 2:** Rendering stops randomly in a project. It typically does not stop in the same spot if rendering is attempted multiple times.
- **Case 3:** Render stops at the same spot in a project no matter how many times rendering is attempted. This failure mode has more than one possible cause.

Case 1: Rendering stops immediately

If the hang occurs immediately upon clicking the *Create* button, there is some configuration problem on your system. Try rendering the supplied demo video. If this fails, the problem is confirmed as a system issue, since we have not been able to reproduce a render problem with the demo file during our in-house testing.

Possible solutions:

- Uninstall and reinstall Studio.
- Uninstall other software that might conflict with Studio (other video editing software, other video codecs, etc.).
- Make sure that you have installed any available service packs for the version of Windows you are running.
- Reinstall Windows over itself (that is, *without* uninstalling first). In Windows XP, this procedure is called *Repair*.

Case 2: Rendering stops randomly

If the render hangs at random points even within the same project, the failures may be due to background tasks, power management or a thermal problem in the computer.

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Possible solutions:

- Check your hard drive for errors and defragment it.
- End any background tasks, such as virus checkers, drive indexers and fax modems.
- Turn off any power management.
- Install cooling fans in the computer case.

Case 3: Render always stops at the same point

If rendering always hangs at the same spot in a particular project, see if other projects have the same problem. If not, the problem project could be corrupt; if they do, try to isolate a common factor.

Finding a solution to this type of failure is much easier if you can identify a particular item in the project that is causing the rendering to stop. Removing the item or trimming it may allow the rendering to complete, though in some cases the failure may simply turn up elsewhere in the project.

Some possible solutions and workarounds:

1. Look at the clips in the project for corrupt video frames. These may show up as gray, black, blocky or distorted frames. If you find any, trim the clip to exclude the offending frames. You could also try recapturing the footage.
2. Defragment your hard drive.
3. Ensure that you have ample storage – preferably tens of gigabytes – on the hard drive you use for video. Rendering may use large amounts of storage, and can be disrupted if space is insufficient.
4. If you have a separate capture drive, make sure to move the auxiliary files folder to that drive.
5. Copy the section where the render stops and put it into a new project. Include 15 to 30 seconds on either side of the error. Try rendering this excerpt to an AVI file and, if successful, use the file to replace the offending section of the original project.
6. Render the entire project to an AVI file, then create a new project and import the file. If you are making a disc, you will need to add your chapter marks and menus to the new project. This workaround works best with NTFS partitions to avoid the 4 GB file limit in FAT32 partitions (allowing only 18 minutes of DV video).

CD or DVD burner is not detected

Answer ID 1593

If Studio cannot locate your disc burner when you want to create your disc project, you should get the error message, "No disc writer device found!" It may be either Studio or Windows that is failing to recognize the drive. If it occurs following the installation of a patch to Studio, it is likely that the patching process did not work correctly; in that case, uninstall, reinstall and update Studio as described in item 2 below.

Some possible solutions and workarounds:

1. Verify that the burner is listed in Device Manager. If it is not, review your burner's documentation or contact the manufacturer to get the device installed properly.
2. Uninstall and reinstall Studio from your original CD, then update it with the most recent patch. See page 232 for instructions.
3. Check the disc burner manufacturer's web-site for a firmware update. You can find the firmware version for your burner on its properties dialog in Device Manager.
4. In Device Manager again, check the hard drive controller to see if it is a VIA or an Intel controller. VIA's web-site is:
www.viaarena.com/?PageID=2
Intel's site is:
appsrv.intel.com/scripts-df/filter_results.asp?strOSs=19&strTypes=DRV&ProductID=182&OSFullName=Windows*+2000&submit=Go%21
5. If you have other disc burning software, such as Nero, Adaptec or Roxio Easy CD Creator, try upgrading that software to the latest version. If Studio still can't detect the drive, uninstall the other disc burning software and try again.

Studio hangs on launch or doesn't launch

Answer ID 1596

Problems on launch can manifest in various ways. Studio may give an error message when launching, or it may freeze in mid-launch,

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or it may hang – fail to return control to you – after what had seemed an uneventful launch.

In all such cases, try any or all the following:

1. Restart the computer. After the reboot, double-click the Studio icon.
2. Wait a few minutes to confirm that the application is really hung. Even when you suspect Studio has failed to launch, wait a few minutes more just in case. On some computers, the launch process may take longer to complete than you anticipate.
3. Uninstall and reinstall Studio. (See page 232 for instructions.)
4. Download and reinstall the driver for your sound card. Remember that the sound card must support DirectX.
5. Remove the sound card from the system. Some older sound cards may not work well with newer versions of Windows. This can be verified by shutting down the computer, removing the sound card and restarting. If Studio now launches, you probably need to replace the sound card (assuming you have updated to the latest drivers as suggested in the previous step).
6. Download and reinstall the software for the graphics card. Remember that the card must support DirectX.

HollywoodFX transitions are still watermarked after upgrading

Answer ID 1804

When upgrading to PRO, make sure you have completed the installation and obtained a keycode. The installer will prompt you to insert a keycode.

To get a keycode, go to www.hollywoodfx.com and log into your account. In the lobby, click on *Register a Product*.

If you have already registered PRO, you can simply click on *Get New Keycode*.

“Cannot initialize the DV capture device” error appears in Capture mode

Answer ID 2716

The error message reads in full: “Pinnacle Studio cannot initialize the DV capture device. Please ensure that the camcorder is connected and the power is on.”

This error message occurs only when you are capturing from a digital source (DV, MMV or Digital8 camcorder) plugged into the DV port (also called a “FireWire” or “1394” port).

If you are capturing from an analog source:

- You need to correct your capture source setting. In the *Capture devices* box on the *Capture source* options dialog, notice that *Video* and *Audio* are set to “DV Camcorder – Pinnacle 1394”, the default setting. To capture from an analog source, select the applicable devices in both lists.
- Many analog capture cards lack an *audio in* jack, so you must both set the audio capture device in Studio to your sound card's *line in*, and cable the analog audio source (VCR or analog camcorder) to the *line in* jack on the sound card.

Possible solutions if you are capturing from a digital source:

1. Verify that the camera is in VTR/VCR mode. For capturing, the device should be running on AC power, not batteries.
2. Disconnect and reconnect the 1394 cable. Make sure you are not mistakenly using a USB cable connected to a USB port. Studio will not capture from a DV or Digital8 camcorder unless it is connected via the DV port.
3. Turn the camcorder off then back on. The mouse pointer should briefly turn to an hourglass when you turn on the camcorder as the device is detected and Windows loads the driver. By default, Windows XP will display a message when the power to the camcorder is cycled.
4. Shut down the computer and move the 1394 capture card into another PCI slot. If you don't have an available slot, swap the capture card with a card in a different slot. Restart the computer.

The Windows hardware wizard should detect the “new” hardware automatically. Follow any on-screen instructions to


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finish loading the driver if any appear. Check Device Manager to see if the driver loaded properly.

5. Verify that the 1394 port and the DV/D8 camcorder drivers are both loaded properly in Device Manager. See "Checking the drivers" immediately below.

Checking the drivers


The procedure for checking your 1394 port and digital camcorder drivers is somewhat different depending on which version of Windows you are using.



To check the drivers under Windows 98SE and Windows Millennium:

1. Open the Windows Device Manager. (See page 228 for instructions on accessing Device Manager.)
2. You should not have any drivers with the yellow exclamation mark error flag  on them. If you do, the driver that is flagged is not loaded properly and will not work correctly.
3. The driver for the capture card is an OHCI-compliant IEEE-1394 host controller driver and is listed under the heading *1394 Bus Controller*.
4. The driver for the camcorder is listed under *Imaging Devices*. When loaded properly, it is called "Microsoft DV camera and VCR" in Windows 98SE, and "*brand-name* DV camcorder" in Windows Millennium, where *brand-name* represents "JVC", "Sony", "Canon", etc.
5. Select the drivers in turn and click first the *Remove* button then the *Refresh* button.

The driver should reload properly. Under Windows 98SE it will ask for the Windows CD. Follow the on-screen instructions until the reload is complete. Under Windows Millennium, Device Manager should be able to find the driver on your hard drive and not ask you to insert a CD, but if it does, follow the on-screen instructions.

To check the drivers under Windows 2000 and Windows XP:

1. Open the Windows Device Manager. (See page 228 for instructions on accessing Device Manager.)
2. You should not have any drivers with the yellow exclamation mark error flag  on them. If you do, the driver that is flagged is not loaded properly and will not work correctly.
3. The driver for the card is an OHCI-compliant IEEE-1394 host controller driver and is listed under the heading *IEEE 1394 Bus host controllers*.
4. The driver for the camcorder, when loaded properly, is listed under the heading *Imaging Devices*.

Click the *Uninstall* button  in the Device Manager toolbar, then the *Scan for hardware changes* button .

5. The driver should reload properly. It should not need to ask for the Windows CD, but if it does, follow the on-screen instructions.

If no error flags are displayed...

Both drivers may be present without any error flags. We recommend that you then uninstall and reload both drivers as follows:

1. Uninstall the DV camcorder driver.
2. Disconnect your DV or Digital8 camcorder from the 1394 port.
3. Uninstall the OHCI-compliant 1394 host controller driver.
4. Reinstall the host controller driver.
5. Reconnect your DV or Digital8 camcorder.

Your camcorder should be automatically redetected and the driver reloaded.

Repairing your Windows installation

If you have Windows 2000 or Windows XP and continue to get the "cannot initialize" message after trying all the steps above, it may be that the 1394 drivers built into Windows are corrupt. We recommend that you reinstall Windows on top of itself (i.e. *without* uninstalling first). For this you will need to run the Windows installer from your original Windows CD. In XP the procedure is called *Repair*. We recommend that you contact your computer manufacturer for help if required.



INSTALLATION PROBLEMS

I am getting an error installing Studio from CD

Solution 1: Restart the computer. After the computer has finished restarting, try to install Studio again.

Solution 2: Inspect the CD for scratches, fingerprints or smudges. Clean off the CD with a soft cloth if necessary. Install Studio again.

Solution 3: End background tasks. Here's how:

Windows 98SE and ME:

Before installing the Pinnacle software, hold down the **Ctrl** and **Alt** keys on the keyboard, then hit the **Delete** key. This will open the Close Program window. Click on the individual applications listed in the Close Program window and click the **End Task** button. Do this for all applications listed in Close Programs except Explorer and SysTray. Some of these applications may control other devices in your system: if a device no longer works you can get it to work again by rebooting your system.

To keep applications from loading when your PC is started (or rebooted), use the following steps.

1. Click on **Start > Run**
2. In the Open box, type: **msconfig**
3. Click **OK**.

In the System Configuration Utility window, click on the far right tab called **Startup**. Remove all checks from the boxes except for System Tray (SysTray.exe).

Windows 2000 and XP

Use the **End Process** button in the Windows Task Manager, or employ one of the software utilities available for Windows 2000 and XP that can assist with this procedure.

Hardware not found during installation.

Possible cause: The PCI slot in which the hardware is installed was not assigned an IRQ in the BIOS or it may be sharing an IRQ with another device. It may also be that the card is not seated completely into the PCI slot.

Solution: Try reseating the card in its original slot or in a different one. In most cases, you may be able to get a different IRQ assignment by simply shutting off the computer and installing the DV card or other hardware in another slot.



OPERATION PROBLEMS

Images are missing from the recording, or the video is jerky.

Possible cause: Your hard drive's transfer speed is too low.

Solution: When working with some UDMA hard drives, the playback may "jump" when an AVI file is played back at higher data rates. This can be traced back to the fact that the hard drive carries out a recalibration while reading the file, thus interrupting playback.

This problem is not caused by Studio, but is the result of the manner in which the hard drive operates and interacts with other system components.

There are several solutions you can use to increase the speed of your hard drive:

1. End task on background applications. Before opening your Studio product, hold down the Ctrl and Alt keys on the keyboard, then hit the Delete key. This will open the Close Program window. Click on the individual applications listed in the Close Program window and select *End Task*. Do this for all applications listed in the Close Program window *except* Explorer and SysTray.
2. Click on *Start > Programs > Accessories > System Tools > ScanDisk*.

3. Make sure *Thorough* is checked, and click *Start* (this may take a while).
4. After ScanDisk is done, click on *Start* > *Programs* > *Accessories* > *System Tools* > *Disk Defragmenter* (this may take a while).
5. Turn off energy-saving features (right-click on your Desktop and select *Properties* > *Screensaver* (under *Energy... Settings*). Make sure everything under *Settings for... power schemes* is set to *Never*.
6. Go to *Start* > *Settings* > *Control Panel* > *System*. Click on the *Performance* tab, then *File System*, then the *Troubleshooting* tab.
7. Click to the left of the *Disable write-behind caching for all drives* option to select it and click *OK*.
8. Under the hard-disk tab, set the *Read-ahead* optimization option to *None*.

In general, this will result in an increase in the data transfer rate. **Caution:** In some hard drives, it can result in a decrease in the write rate!

Note: Video-editing programs do not multitask very well. Do not use any other program while making movie (videotape or CD) or capturing. You can multitask while editing.

There is no video in the Player preview.

Solution 1: Change video resolution and/or color depth on the Display Properties dialog:

1. Right-click your Desktop and select *Properties*, then click the *Settings* tab on the dialog.
2. Under *Colors*, try each of 16-bit, 24-bit and 32-bit.
3. Under *Screen resolution*, again try each available setting from 800x600 upwards.

Solution 2: You may be using either a generic Windows graphics card driver or an older version of your graphics card. Your graphics card driver may also be corrupt. Please contact your graphics card vendor to ensure you have properly installed the most current driver. Reinstall your graphics driver with the help of your video card manufacturer's technical support, or download and install the latest driver from the manufacturer's web-site.

Solution 3: You may not have DirectX installed properly. Go to *Start > Programs > Studio > Help > DirectX Diagnostic Tool*. On the *Display* tab, click the *Test* button next to Direct Draw. After running that test, run the Direct 3D test. If your card fails either of these tests, please contact your graphics card vendor for support.

Note: Please visit our web-site for additional help with troubleshooting DirectX issues, include specific solutions for particular capture hardware.

The playback to the computer monitor is jerky – audio or video frames are dropped.

Solution: If you are using preview quality, remember that it has no effect on the quality of the final tape. When you make tape, Studio will go back to the DV source and record full-quality video from it.

My DV device control is unavailable or unreliable under Windows 98.

Possible cause: You are not using Windows 98 Second Edition as an operating system, and the Second Edition device drivers are more robust.

My batch capture is inaccurate (DV tapes only).

Possible cause: You do not have continuous, uninterrupted timecode on your source tapes. SmartCapture needs continuous timecode to accurately locate and recapture your clips.

Solution: Make sure your source tapes have continuous, uninterrupted timecode (see “Continuous timecode” on page 23); or, Make sure you are cueing to the segment of tape that holds the clip you are currently attempting to recapture (see page 186).

When I output to tape the video and/or audio stutters or is absent.

Background: There are many possible causes for this kind of problem. To understand why, consider that the data coming from and flowing to your camera is vulnerable to interference at any stage along its journey.

Digital data travels from the camcorder through the IEEE-1394 cable, into the 1394 card and onto the system main board. It now crosses to the hard drive cable and up to the hard drive, where it is

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finally recorded. Outflowing data makes the same trip in reverse. Any process that disrupts or delays the flow of data at any point is a potential source of video output problems.

Solution 1: Make sure that you are losing *no* frames during video capture. Dropped frames during capture may result in problems during output as well. Capture problems have a different set of troubleshooting options. See the Pinnacle knowledge base on our web site at:

www.pinnaclesys.com/support/studio9

Solution 2: Save your current project, close all your applications, and restart the system. When Windows comes back, open your project in Studio without running any other programs, and try to output to tape. If the issues persist, try the next solution.

Solution 3: Tune your system:

- Remove wallpaper from the Desktop.
- Remove temporary Internet files from the system and empty the Recycle Bin.
- Check the system for viruses.
- Turn off any screen savers, and disable any power-saving features of the operating system or the BIOS. Most power-saving features can be accessed via the *Power Options* icon in Control Panel.
- Some systems have further power-saving features that can only be disabled in the BIOS. Please refer to your system's documentation for more information.
- Some USB devices – scanners, webcams etc. – can interfere with other types of software including video-editing applications like Studio. As a troubleshooting measure, these devices should be temporarily removed.

Solution 4: Improve hard drive efficiency.

- **Use a separate capture hard drive:** When working with digital video, the use of a second, separate hard-drive for captured video data is recommended. This eliminates the problem of Windows competing with Studio for the capture drive – for instance, when it updates the system swap file.
- **Defragment the hard drive:** Hard drives become “fragmented” with use, meaning that files are stored inefficiently in small chunks rather than as a single block. This can slow file access significantly, so it is important to defragment the hard drive on a

regular basis. The Disk Defragmenter utility can be found in the *Accessories > System Tools* folder on the *Start* menu of most Windows installations.

- **Check hard drive data rates:** The Pinnacle video-editing software has a built-in test that measures the speed at which the capture drive transfers data. If the drive is not running at optimum performance levels, some video-editing operations may fail.

To run the hard drive data transfer rate test:

- Click on *Setup > Capture Source*. In the lower right of the setup box, click the *Test Data Rate* button.

The hard drive test will run. On most systems, data rates will be between 25,000 and 35,000 Kbytes/sec.

Note: If you make changes to the system that increase the speed of the capture hard drive – such as enabling DMA – you will need to run the hard drive data rate test again so that the software will recognize the change.

Solution 5: Use our PPE utility.

Use Pinnacle's PCI Performance Enhancer utility, which is installed on the *Tools* submenu under Studio's entry on your *Start > Programs* menu.

Solution 6: Update the hard drive controller driver.

In Device Manager, check the hard drive controller to see if it is a Via or Intel controller. If it is, get a driver update from the vendor's web-site (as usual, enter the URL as continuous text on a single line):

VIA:

www.viaarena.com/?PageID=2

Intel:

[appsrv.intel.com/scripts-df/filter_results.asp?
strOSs=19&strTypes=DRV&ProductID=182&
OSFullName=Windows*+2000&submit=Go%21](http://appsrv.intel.com/scripts-df/filter_results.asp?strOSs=19&strTypes=DRV&ProductID=182&OSFullName=Windows*+2000&submit=Go%21)

APPENDIX D:

Videography tips

To shoot good video, then create from it an interesting, exciting or informative movie, is something anyone with a little basic knowledge can achieve.

Starting from a rough script or shooting plan, the first step is to shoot your raw video. Even at that stage, you should be looking ahead to the editing phase by making sure you will have a good set of shots to work from.

Editing a movie involves juggling all your fragments of footage into some kind of harmonious whole. It means deciding on the particular techniques, transitions and effects that will best express your intent.

An important part of editing is the creation of a soundtrack. The right sound – dialog, music, commentary or effect – can work with the visuals to create a whole greater than the sum of its parts.

Studio has the tools you need to create professional-quality home video. The rest is up you – the videographer.

Creating a shooting plan

It is not always necessary to have a shooting plan, but it can be very helpful for large video projects. The plan can be as simple or as complex as you like. A simple list of planned scenes might be enough, or you might also want to include some notes regarding detailed camera directions or prepared dialog. The really ambitious can go all the way to a full-fledged script in which every single camera angle is described in detail along with notes about duration, lighting and props.

Draft of a simple shooting plan:

Title: "Jack on the kart track"				
No.	Camera angle	Text / Audio	Duration	Date
1	Jack's face with helmet, camera zooms out	"Jack is driving his first race...". Noise of engines in the background.	11 sec	Tue. 06/22
2	On the starting line, driver's perspective; low camera position.	Music is played in the hall, noise of engines.	8 sec	Tue. 06/22
3	Man with a starting flag is accompanied into the scene to the start position. Camera stays, man goes out of the scene after start.	"Let's go...". Carry out the start, add starting signal.	12 sec	Tue. 06/22
4	Jack on the start position from the front, camera follows, shows Jack up to the bend, now from behind.	Music from the hall no longer audible, fade up same music from CD over noise of engines.	9 sec	Tue. 06/22
5	...			

Editing

Using varying perspectives

An important event should always be shot from varying perspectives and camera positions. Later, during editing, you can use the best camera angles alone or in combination. Make a conscious effort to tape events from more than one camera angle (first the clown in the circus ring, but then also the laughing spectator from the clown's point of view). Interesting events can also take place behind the protagonists or the protagonists may be seen in a reverse angle. This can be helpful later when trying to establish a sense of balance in the movie.

Close-ups

Don't be stingy with close-ups of important things or persons. Close-ups usually look better and more interesting than long shots do on a television screen, and they work well in post-production effects.

Long shots / Semi-long shots

Long shots provide the viewer with an overview and establish the scene of the action. However, these shots can also be used to tighten longer scenes. When you cut from a close-up to a long shot, the viewer no longer sees the details, and it is thus easier to make a chronological jump. Showing a spectator in a semi-long shot can also provide visual relief from the main action, and the opportunity of a transition away from the action if desired.

Complete actions

Always shoot complete actions with a beginning and an end. This makes editing easier.

Transitions

Cinematic timing requires some practice. It is not always possible to film long events in their entirety, and in movies they often have to be represented in severely abbreviated form. Nonetheless, the plot should remain logical and cuts should almost never call attention to themselves.

This is where the transition from one scene to the next is important. Even if the action in neighboring scenes is separated in time or space, your editorial choices can make the juxtaposition so smooth that the viewer bridges the gap without conscious attention.

The secret to a successful transition is establishing an easily-felt connection between the two scenes. In a *plot-related* transition, the connection is that of successive events in an unfolding story. For example, a shot of a new car might be used to introduce a documentary about its design and production.

A *neutral* transition doesn't in itself imply a story development or a change of time or place, but can be used to smoothly connect different excerpts from a scene. For example, cutting away to an interested audience member during a podium discussion lets you then cut back unobtrusively to a later point in the same discussion, omitting the part between.

External transitions show something apart from the action. For example, during a shot inside the marriage registry, you might cut to the exterior of the marriage registry, where a surprise is already being set up.

Transitions should underscore the message of the film and must always fit the respective situation, in order to avoid confusing viewers or distracting from the actual storyline.

Logical sequence of action

The shots strung together during editing must interact appropriately in relation to the action. Viewers will be unable to follow the events unless the storyline is logical. Capture viewer interest from the very beginning with a fast-paced or spectacular start and maintain that interest until the very end. Viewers can lose interest or become disoriented if scenes are strung together in a manner that is illogical or chronologically false, or if scenes are too hectic or short (under three seconds). There should be some continuity of motif from one scene to the next.

Bridging the gaps

Make an effort to bridge the gaps from one filming location to another. You can use close-ups, for example, to bridge chronological jumps, zooming in on the face, then back out after a few seconds onto a different scene.

Maintain continuity

Continuity – consistency of detail from one scene to the next – is vital in providing a satisfying viewing experience. Sunny weather does not fit with spectators who opened their umbrellas.

Tempo of cuts

The tempo at which a film cuts from one scene to the next often influences the message and mood of the film. The absence of an expected shot and the duration of a shot are both ways of manipulating the message of the film.

Avoid visual disjunctions

Stringing together similar shots in succession may result in visual disjunctions. A person may be in the left half of the frame one moment and in the right half of the frame the next, or may appear first with and then without eyeglasses.

Do not string together pan shots

Pan shots should not be strung together unless they have the same direction and tempo.

Rules of thumb for video editing

Here are some guidelines that may be helpful when you come to edit your movie. Of course, there are no hard and fast rules, especially if your work is humorous or experimental.

- Do not string together scenes in which the camera is moving. Pans, zooms, and other moving shots should always be separated by static shots.
- Shots that follow one another should be from different camera positions. The camera angle should vary by at least 45 degrees.
- Sequences of faces should always be shot alternately from varying angles of view.
- Change perspectives when shooting buildings. When you have similar shots of the same type and size, the picture diagonal should alternate between front left to rear right and vice versa.
- Make cuts when persons are in motion. The viewer will be distracted by the ongoing motion and the cut will go almost without notice. In particular, you can cut to a long shot from the middle of the motion.
- Make harmonious cuts; avoid visual disjunction.
- The less motion there is in a shot, the shorter it should be. Shots with fast movements can be longer.
- Long shots have more content, so they should also be shown longer.

Ordering your video sequences in a deliberate manner not only permits you to produce certain effects, but even enables you to convey messages that cannot or should not be shown in pictures. There are basically six methods of conveying messages through cuts:

Associative cuts

Shots are strung together in a certain order to trigger associations in the mind of the viewer, but the actual message is not shown. Example: A man bets on a horse race and, in very next scene, we see him shopping for an expensive new car at a car dealership.

Parallel cuts

Two actions are shown in parallel. The film jumps back and forth between the two actions; making the shots shorter and shorter until the end. This is a way of building suspense until it peaks. Example: Two different cars drive from different directions at high speed toward the same intersection.

Contrast cuts

The film purposely cuts unexpectedly from one shot to another, very different shot, in order to point up the contrast to the viewer. Example: A tourist lying on the beach; the next shot shows starving children.

Substitutionary cut

Events that cannot or should not be shown are replaced by other events (a child is born, but instead of childbirth, the blossoming of a flower bud is shown).

Cause and effect cuts

Shots are related by virtue of cause and effect: without the first shot, the second would be incomprehensible. Example: A man fights with his wife and, in the very next shot, winds up sleeping under a bridge.

Formal cuts

Shots that vary in content can be strung together if they have something in common – the same shapes, colors, or motions, for example. Examples: A crystal ball and the earth; a yellow raincoat and yellow flowers; a falling skydiver and a falling feather.

Soundtrack production

Soundtrack production is an art, but it is an art one can learn. Of course, it is no easy task to create a superb narration, but short, informative comments are often very helpful for the viewer. Whatever narration there is should sound natural, expressive and spontaneous, not wooden or stiff.

Keep comments brief

A general rule applicable to all commentary is that less is more. Pictures should speak for themselves, and things that are evident to viewers from the pictures require no comment.

Preserve original sounds

Spoken commentary should be mixed with both the original sounds and the music in such a way that the original sounds can still be heard. Natural sound is part of your video footage and should not be cut away altogether if at all possible, because video without natural sound can easily seem sterile and lacking in authenticity. Frequently, however, the recording equipment captures noises from aircraft and cars that do not appear in the scene later. Sounds such as these, or loud wind noises, which can be distracting or annoying, should be masked, filtered or replaced with appropriate narration or music.

Select appropriate music

Appropriate music adds a professional finishing touch to your movie and can do a lot to reinforce the message of a video. The music selected, however, should always be appropriate to the message of the film. This is sometimes a time-consuming matter and a challenge, but greatly appreciated by the viewer.

Title

The title should be informative, describe the contents of the movie, and arouse interest. With the Title Editor there are no limits to how creative you can be. As a rule, you can let your fancy run free when designing a title for your video.

Use a short, clear title

Titles should be short and in a large, legible font.

Title colors

The following combinations of background and text are easy to read: white with red, yellow with black, and white with green.

Exercise caution with very white titles on a very black background. Some video systems are unable to handle contrast ratios in excess of 1:40 and are unable to reproduce such titles in detail.

Time on screen


As a rule of thumb, a title should be displayed long enough to be read twice. Allow about three seconds for a title with ten letters. Allow an additional second of on-screen time for every five additional letters.


“Found” titles


Besides postproduction titles, natural titles like directional signs, street signs or title pages of local newspapers also create interesting possibilities.

APPENDIX E:

Glossary

Multimedia terminology contains computer and video terminology. The most important terms are defined below. Cross-references are indicated by .

ActiveMovie: Software interface by Microsoft for the control of multimedia devices under Windows.  *DirectShow*, *DirectMedia*


ADPCM: Acronym for Adaptive Delta Pulse Code Modulation, a method of storing audio information in a digital format. This is the audio encoding and compression method used in CD-I and  *CD-ROM* production.


Address: All available saving positions in a computer are numbered (addressed). By means of these addresses each saving position can be occupied. Some addresses are reserved for the exclusive use of particular hardware components. If two components are using the same address, this is called an "address conflict".




Aliasing: An inaccurate display of an image due to the limitations of the output device. Typically, aliasing appears in the form of jagged edges along curves and angled shapes.


Anti-aliasing: A method of smoothing out jagged edges in bitmap images. This is usually accomplished by shading the edges with pixels intermediate in color between the edge and the background, making the transition less apparent. Another method of anti-aliasing involves using higher resolution output devices.

Aspect ratio: The ratio of width to height in an image or graphic. Keeping the aspect ratio fixed means that any change to one value is immediately reflected in the other.

AVI: Audio Video Interleaved, a standard format for digital video (and  *Video for Windows*).

Batch capture: An automated process that uses an  *edit decision list* to locate and recapture specific clips from a videotape, usually at a higher data rate than the clip was originally captured.

BIOS: Acronym for Basic Input Output System, which refers to basic input and output commands saved in a  *ROM*, *PROM* or  *EPROM*. The essential task of the BIOS is the control of input and output. When the system is started, the ROM-BIOS carries out some tests.  *Parallel port*, *IRQ*, *I/O*

Bit: Abbreviation of "BInary digiT", the smallest element of a computer's memory. Among other things, bits are used to store the color values of pixels in an image. The more bits used for each  *pixel*, the greater the number of available colors. For example:

1-bit: each pixel is either black or white.

4-bit: allows 16 colors or gray shades.

8-bit: allows 256 colors or gray shades.


16-bit: allows 65,536 colors.


24-bit: allows about 16.7 million colors.

Bitmap: An image format made up of a collection of dots or "pixels" arranged in rows.  *Pixel*

Blacking: The process of preparing a videotape for insert editing by recording video black and continuous control track on the entire tape. If the recording deck supports timecode, continuous timecode will be recorded simultaneously (also called "striping").

Brightness: Also "luminance". Indicates the brightness of video.

Byte: One byte corresponds to eight  *bits*. With one byte, exactly one alphanumeric character can be displayed (i.e. a letter, number).

CD-ROM: Mass storage media for digital data, such as digital video. CD-ROMs can be read from but not written (recorded) onto:  *ROM* is an acronym for Read-Only Memory.

Channel: Classifications of information within a data file to isolate a particular aspect of the file. For example, color images use different channels to classify the color components in the image. Stereo audio files use channels to identify the sounds intended for

the left and right speakers. Video files use combinations of the channels used for image and audio files.



Clip: In Studio, any media type that goes on the Movie Window Storyboard or Timeline, including video images, trimmed video scenes, images, audio files and disc menus.

Clipboard: A temporary storage area shared by all Windows programs, used to hold data during cut, copy, and paste operations. Any new data you place onto the clipboard immediately replaces the existing data.

Closed GOP:  *GOP*

Codec: Contraction of compressor/decompressor – an algorithm that compresses (packs) and decompresses (unpacks) image data. Codecs can be implemented in either software or hardware.


Color depth: Number of bits delivering the color information for each pixel. A 1-bit color depth allows $2^1=2$ colors, an 8-bit depth allows $2^8=256$ colors, and a 24-bit depth allows $2^{24}=16,777,216$ colors.

Color model: A way to mathematically describe and define colors and the way they relate to each other. Each color model has its own strengths. The two most common color models are  *RGB* and  *YUV*.

Color saturation: Intensity of a color.

Complementary color: Complementary colors are opposite in value to primary colors. If you were to combine a color with its complement, the result would be white. For example, the complementary colors of red, green and blue are cyan, magenta and yellow respectively.

COM Port: A serial port located on the back of your computer for attaching a modem, plotter, printer or mouse to the system.



Composite video: Composite video encodes luminance and chrominance information into one signal.  *VHS* and 8mm are formats that record and play back composite video.


Compression: A method for making files smaller in size. There are two types of compression: *lossless* and *lossy*. Files compressed with a lossless scheme can be restored unchanged from their original state. Lossy schemes discard data during compression, so


some image quality is sacrificed. The loss of quality may be negligible or severe depending on the amount of compression.


Cropping: Choosing the area of an image to be displayed.

Data rate: The quantity of data transmitted per unit time; for example, the number of bytes read from or written to a hard drive per second, or the amount of video data processed per second.

Data transfer rate: The measurement of the speed at which information passes between the storage device (e.g.  *CD-ROM* or hard drive) and the display device (e.g. monitor or  *MCI* device). Depending on the devices used, some transfer rates may offer better performance than others.

DCT: Discrete Cosine Transformation – part of  *JPEG* image data compression and related algorithms. The brightness and color information is saved as a frequency coefficient.

DirectShow: System extension by Microsoft for multimedia applications under Windows.  *ActiveMovie*



DirectMedia: System extension by Microsoft for multimedia applications under Windows.  *ActiveMovie*

DirectX: A bundle of several system extensions developed by Microsoft for Windows 95 and its successors to make possible video and game acceleration.

Dissolve: A transitional effect in which the video is faded from one scene to the next.

Dithering: Increasing the number of apparent colors in an image by the application of color patterns.

Decibel (dB): A unit of measurement of the loudness of sound. An increase of 3 dB doubles the loudness.



Digital8: Digital videotape format that records  *DV*-coded audio and video data on  *Hi8* tapes. Currently sold only by Sony, Digital8 camcorders and VCRs can play both Hi8 and 8mm cassettes.

Digital video: Digital video stores information  *bit* by bit in a file (in contrast to analog storage media).



DMA: Direct Memory Access.

Driver: A file containing information needed to operate peripherals. The video capture driver operates a video capture board, for example.

DV: Digital videotape format for recording digital audio and video on 1/4"-wide metal evaporated tape. Mini-DV tapes hold up to 60 minutes of content, while standard DV tapes can hold up to 270 minutes.


ECP: "Enhanced Compatible Port". Enables accelerated bi-directional data transfer via the  *parallel port*.  *EPP*

Edit decision list (EDL): A list of clips and effects in a particular order that will be recorded onto your output tape, disc or file. Studio allows you to create and edit your own edit decision list by adding, deleting and reordering clips and effects in the Movie Window.

EPP: "Enhanced Parallel Port". Enables accelerated bi-directional data transfer via the  *parallel port*; recommended for Studio DV.  *ECP*


EPROM: "Erasable Programmable Read-Only Memory". Memory chip that after programming retains its data without power supply. The memory contents can be erased with ultraviolet light and rewritten.


Fade to/from black: A digital effect that fades up from black at the beginning of a clip or down to black at the end.



Field: A  *frame* of video consists of horizontal lines and is divided into two fields. The odd lines in the frame are Field 1; the even-numbered lines are Field 2.

File format: The organization of information within a computer file such as an image or word processor document. The format of a file is usually indicated by its "file extension" (e.g. *doc*, *avi* or *wmf*).

Filters: Tools that alter data to produce special effects.


FireWire: Apple Computer's trademarked name for the  *IEEE-1394* serial data protocol.


Frame: A single image in a video or animation sequence. If using full NTSC or PAL resolution, one frame consists of two interlaced fields.  *NTSC*, *PAL*, *field*, *resolution*


Frame rate: The frame rate defines how many frames of a video sequence are played in one second. The frame rate for  NTSC video is 30 frames per second. The frame rate for  PAL video is 25 frames per second.



Frame size: The maximum size for displaying image data in a video or animation sequence. If an image intended for the sequence is larger than the frame size, it must be cropped or scaled to fit.



Frequency: The number of repetitions in a periodic process (like a sound wave or an alternating voltage) per unit of time. Usually measured in repetitions per second, or Hertz (Hz).


GOP: In  MPEG compression the data stream is first divided into "Groups Of Pictures" – sections of several frames each. Each GOP contains three types of frames: I-Frames, P-Frames (pictures) and B-Frames.

GOP size: The GOP size defines, how many I-Frames, B-Frames and P-Frames are included in one  GOP. For example, current GOP sizes are 9 or 12.

Hardware codec: Compression method that uses special hardware to create and play back compressed digital video sequences. A hardware codec may offer better encoding speed and image quality than a codec implemented completely in software.  *Codec, Software codec*

Hi8: Improved version of  Video8 using  S-Video recorded on metal particle or metal evaporated tape. Because of higher luminance resolution and wider bandwidth, the result is sharper pictures than Video8.

HiColor: For images, this normally means a 16-bit (5-6-5) data type that can contain up to 65,536 colors. TGA file formats support images of this type. Other file formats require prior conversion of a HiColor image into  TrueColor. For displays, HiColor normally refers to 15-bit (5-5-5) display adapters that can display up to 32,768 colors.  *Bit*




Huffman coding: Technique used in  JPEG and other data compression methods in which seldom occurring values receive a long code, while frequently-occurring values receive a short code.


IDE: "Integrated Device Electronics" – a hard-drive interface that combines all drive control electronics on the drive itself, rather than on the adapter connecting the drive to the expansion bus.

IEEE-1394: Developed by Apple Computers and introduced as FireWire, this is a serial data transmission protocol with rates up to 400 Mbits/sec. Sony offers a slightly modified version for transmitting DV signals named i.LINK, providing transmission speeds up to 100 Mbits/sec.

Image: An image is a reproduction, or picture of something. The term is often applied to digitized pictures, consisting of pixels, that can be shown on a computer display and manipulated by software.


Image compression: Method of reducing the amount of data required to store digital image and video files.


Interlaced: The screen refresh method used by television systems. The  *PAL* TV image consists of two interleaved image halves ( *fields*) of 312½ lines each. The  *NTSC* TV image consists of two image halves of 242½ lines each. The fields are displayed alternately to produce a blended image.

Interleave: An arrangement of audio and video to promote smoother playback and synchronization or compression. The standard  *AVI* format equally spaces audio and video.


I/O: Input/Output.

IRQ: “Interrupt Request”. An “interrupt” is a temporary break in the main processing stream of a computer so that housekeeping or background tasks can be performed. Interrupts can be requested by either hardware (e.g. keyboard, mouse) or software.

JPEG: Joint Photographic Experts Group, and the standard developed by them for compressing digital frames based on  *DCT*.

Kbyte (also KB): One Kbyte (kilobyte) contains 1024  *bytes*. The “K” here stands for the number 1024 (2^{10}), and not 1000 as in the metric prefix.


Key color: A color whose display is suppressed so that a background image can show through. Most commonly used when overlaying one video sequence on top of another, allowing the underlying video to display wherever the key color appears.


Key frames: In some compression methods, such as  *MPEG*, the video data of certain frames – the key frames – is stored completely in the compressed file, while any intervening frames are only partially saved. On decompression these partial frames reconstruct their data from the key frames.

Laser disc: Medium that stores analog video. Information on laser discs cannot be modified.

LPT:  *Parallel port*

Luminance:  *Brightness*



M1V: (File extension for) an MPEG file that contains video data only.  *MPA, MPEG, MPG*

Mbyte (also MB): One Mbyte (megabyte) corresponds to 1024  *Kbytes* – 1024 x 1024 bytes.

Mark In / Mark Out: In video editing, the mark in and mark out times refer to the starting and ending timecodes that identify the portions of clips to be included in the project.


MCI: Media Control Interface. Programming interface developed by Microsoft recording and playing back audio and video data. It is also used to connect a computer to an external video source such as a VCR or laser disc.

Modulation: The encoding of information upon an empty carrier signal.

Motion-JPEG (M-JPEG): A  *Video for Windows* format, specified by Microsoft, for encoding video sequences.  *JPEG* compression is used to compress each frame individually.


MPA: (File extension for) an MPEG file that contains audio data only.  *MIV, MPEG, MPG*


MPEG: Motion Picture Experts Group, and the standard developed by them for the compression of moving images. Compared to M-JPEG, it offers 75-80% data reduction with the same visual quality.




MPG: (File extension for) an MPEG file that contains both video and audio data.  *MIV, MPEG, MPA*

MPV: (File extension for) an MPEG file that contains video data only.  *MPA, MPEG, MPG*


Non-interlaced: Describes an image refresh method in which the complete image is generated as a single field without skipping lines. A non-interlaced image (most computer monitors) flickers much less than an interlaced image (most TVs).

NTSC: National Television Standards Committee, and the color TV standard created by them in 1953. NTSC video has 525 lines per frame and 60 image fields per second. It is used in North and Central America, Japan and other countries.  *PAL, SECAM*


PAL: "Phase Alternation Line", a color TV standard developed in Germany and used throughout most of Europe. PAL video has 625 lines per frame and 50 image fields per second.  *NTSC, SECAM*


Parallel port: Parallel port data is transmitted via an 8-bit data line. This means that eight  *bits* (one  *byte*) can be transmitted at once. This kind of transmission is much faster than serial transmission, but is not appropriate for long-distance connections. Parallel ports are often named "LPT n ", where n is a number (e.g. "LPT1").  *Serial port*

Pixel: The smallest element of a monitor image. The word is an abbreviation of "picture element".

Port: Electrical transfer point for the transmission of audio, video, control or other data between two devices.  *Serial port, Parallel port*


Primary colors: The colors that are the basis of the RGB color model: red, green, and blue. It is possible to create most other colors on a computer screen by varying the blend of these primaries.

QSIF: Quarter Standard Image Format. An MPEG-1 format specifying a resolution of 176 x 144 under PAL and 176 x 120 under NTSC.  *MPEG, SIF*


Quantization: One part of the  *JPEG* image data compression strategy. Relevant details are represented precisely, while details that are less relevant for the human eye are represented with less precision.


Raster: The area of a video display that is covered by sweeping the electron beam of the display in a series of horizontal lines from upper left to lower right (from the viewer's perspective).

Redundancy: This trait of images is exploited by compression algorithms. Superfluous information can be eliminated during compression and restored without loss during decompression.

Resolution: The number of pixels that can be displayed on the monitor horizontally and vertically. The higher the resolution, the more details can be displayed.  *Pixel*


RGB: Red, Green and Blue: the primary colors in additive color mixing. RGB designates the method used in computer technology of encoding image information in pixels, each containing some combination of the three primaries.



ROM: Read Only Memory: Memory storage that, having been programmed once, retains its data without requiring electrical power.  *EPROM*


Run Length Encoding (RLE): A technique used in many image compression methods, including  *JPEG*. Repeating values are not stored separately but with a counter to indicate how many times the value occurs in succession – the length of the “run”.


Scaling: Adaptation of an image to a desired size.


SCSI: Small Computers System Interface. SCSI was long preferred as the hard drive interface for some high-performance PCs because of its high data rate. Up to eight SCSI devices can be connected to a computer at the same time.

SECAM: “Séquentiel Couleur à Mémoire”, a color TV transmission system used in France and Eastern Europe. Like PAL, SECAM video has 625 lines per frame and 50 image fields per second.  *NTSC, PAL*


Serial port: Data transmitted via a serial port is processed one  *bit* at a time; that is, “serially” – one after another. The transmission rate is much slower than that of a parallel port, where parallel data lines allow multiple bits to be sent simultaneously. Serial ports are named “COM n ”, where n is a number (e.g. “COM2”).  *Parallel port*

SIF: Standard Image Format. An MPEG-1 format specifying a resolution of 352 x 288 under PAL and 352 x 240 under NTSC.  *MPEG, QSIF*

Single frame: A single  *frame* is part of a series or sequence. When this series is viewed at sufficient speed, the illusion of a “moving picture” is created.

Software codec: Compression method that can create and play back compressed digital video sequences without special hardware. The quality of the sequences depends on the performance of the complete system.  *Codec, Hardware codec*


Still video: Still images (or “freeze-frames”) extracted from video.

S-VHS: Improved version of VHS using S-Video and metal particle tape to deliver higher luminance resolution, resulting in sharper pictures than VHS.  *VHS, S-Video*

S-Video: With S-Video (Y/C) signals, the brightness (luminance or “Y”) and the color (chrominance or “C”) information are transferred separately using multiple wires, avoiding modulating and demodulating the video and the resulting loss of picture quality.

Timecode: Timecode identifies the position of each frame in a video sequence with respect to a starting point (normally the beginning of the shot). The usual format is H:M:S:F (hours, minutes, seconds, frames), e.g. “01:22:13:21”. Unlike a tape counter (which can be “zeroed” or reset at any point in a tape), timecode is an electronic signal written onto videotape, and is permanent once it is assigned.

Transition: The visual connection between adjacent video clips, ranging from a simple “cut” to a showy animated effect. The common transitions like cuts, fades, dissolves, wipes and slides are part of the visual language of film and video. They can convey passages of time and changes of viewpoint concisely – and often subliminally.

TrueColor: The name indicates an image with enough color resolution to appear “true to life”. In practise, TrueColor normally refers to 24-bit RGB color, which allows about 16.7 million combinations of the red, green and blue primary colors.  *Bit, HiColor*


TWAIN driver: TWAIN is a standardized software interface allowing graphics and capture programs to communicate with devices that supply graphical data. If the TWAIN driver is installed, the capture function of a graphics application can be used to load images directly from your video source into the program. The driver supports 32-bit programs only and captures images in 24-bit mode.

VCR: “Video cassette recorder”.

VHS: “Video Home System” – Popular video standard for home VCRs. Half-inch tape is used to store “composite” signals incorporating both brightness and color information.

VISCA: Protocol used with certain devices for controlling external video sources from computers.

Video8: Analog video system using 8mm tape. Video8 recorders generate composite signals.

Video CD: CD-ROM standard that uses  *MPEG* compressed videos.

Video decoder: Converts digital information into analog video signals.

Video encoder: Converts analog video signals into digital information.

Video for Windows: A Microsoft Windows system extension that can record digital video sequences to files on a hard drive and subsequently play them back.

Video scan rate: Frequency with which the video signal is scanned onto an image display. The higher the video scan rate, the higher the image quality and the less noticeable the flicker.

WAV: (File extension for) a popular file format for digitized audio signals.

White balance: In an electronic camera, this is the adjustment of the amplifiers for the three color channels (red, green and blue) so that white areas of the scene do not show a color cast.

Y/C: Y/C is a color signal with two components: brightness information (Y) and color information (C).

YUV: The color model of a video signal where Y delivers the brightness information and U and V the color information.

APPENDIX F:

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APPENDIX G:

Keyboard shortcuts

The terms *Left*, *Right*, *Up* and *Down* in this table refer to the arrow (cursor) keys.

Main Studio interface

Space bar	Play and stop
J	Fast reverse (hit multiple times for faster playback)
K	Halt playback
L	Fast forward (hit multiple times for faster playback)
X or Ctrl+Up	Step forward 1 frame
Y or Ctrl+Down	Step back 1 frame
A or I	Mark in
S or O	Mark out
Ctrl+Left	Trim in point by -1 frame
Ctrl+Right	Trim in point by +1 frame
Alt+Left	Trim out point by -1 frame
Alt+Right	Trim out point by +1 frame
Alt+Ctrl+Left	Rolling trim out point by -1 frame (trims following clip too)
Alt+Ctrl+Right	Rolling trim out point by +1 frame
G	Clear mark in and mark out
D	Go to mark in (in trimmer tool)
F	Go to mark out (in trimmer tool)
E or Home	Go to start
R or End	Go to end
Left	Select previous clip

Right	Select next clip
Delete	Delete selected clip(s)
Insert	Split clip at scrubber position
Page up	Go to next page in Movie Window
Page down	Go to previous page in Movie Window
Numeric pad +	Zoom in the Timeline
Numeric pad -	Zoom out the Timeline
C	Set menu chapter
V	Clear menu chapter
M	Set return to menu
Ctrl+Page up	Go to previous menu chapter
Ctrl+Page down	Go to next menu chapter

Title Editor

Alt+Plus	Bring to front
Alt+Minus	Send to back
Ctrl+Plus	Bring forward one layer
Ctrl+Minus	Send back one layer
Ctrl+0	Text justification off
Ctrl+1	Text justification: bottom left
Ctrl+2	Text justification: bottom center
Ctrl+3	Text justification: bottom right
Ctrl+4	Text justification: middle left
Ctrl+5	Text justification: middle center
Ctrl+6	Text justification: middle right
Ctrl+7	Text justification: top left
Ctrl+8	Text justification: top center
Ctrl+9	Text justification: top right
Ctrl+K	Kern, leading and skew
Ctrl+M	Move, scale and rotate
Shift+Left	Expand character selection left
Shift+Right	Expand character selection right
Ctrl+Left	Reduce horizontal scale of, or squeeze (kern), text selection depending on current edit mode (move/scale/rotate or kern/skew/leading)

Ctrl+Right	Increase horizontal scale of, or stretch (kern), text selection
Ctrl+Down	Reduce scale or leading of text selection depending on current edit mode
Ctrl+Up	Increase scale or leading of text selection
Shift+Ctrl+Left	Same as Ctrl+Left (coarse)
Shift+Ctrl+Right	Same as Ctrl+Right (coarse)
Shift+Ctrl+Down	Same as Ctrl+Down (coarse)
Shift+Ctrl+Up	Same as Ctrl+Up (coarse)
Alt+Left	In text selection: Move characters left. No selection: Move left all text from cursor to end of line.
Alt+Right	In text selection: Move characters right. No selection: Move right all text from cursor to end of line.
Shift+Alt+Left	Same as Alt+Left (coarse)
Shift+Alt+Right	Same as Alt+Right (coarse)

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